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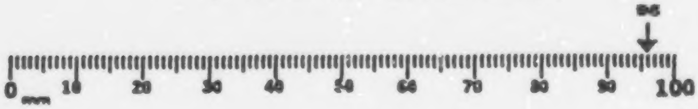

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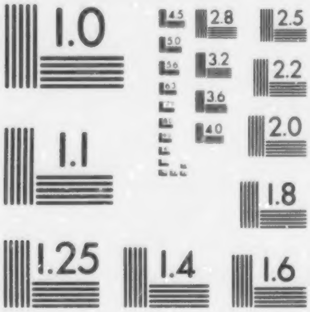

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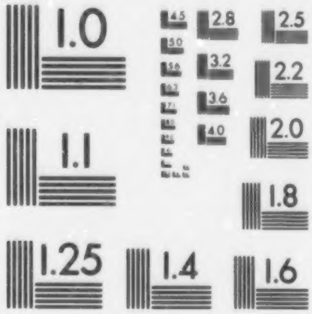

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Annual Report on Forest Management

For the year April 1, 1998 to March 31, 1999

Minister of Natural Resources of
the Province of Ontario

Ontario

To her Honour
The Lieutenant-Governor of the
Province of Ontario

May it please your Honour

The undersigned begs respectfully to present to your Honour the Annual Report on Forest Management for the fiscal year beginning April 1, 1998 and ending March 31, 1999.

John C. Snobelen
Minister

December, 2000

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Executive Summary

In 1994, the Environmental Assessment (EA) Board in Ontario issued its decision on the Ministry of Natural Resources (MNR) Class Environmental Assessment for Timber Management on Crown Lands in Ontario.

The EA Board's decision approved the timber management process MNR described, with 115 binding terms and conditions. One of these conditions requires MNR to make an annual report on forest management to the provincial legislature. This is the fourth such annual report. It covers the year April 1, 1998 to March 31, 1999 but, because of the time period when data was collected, some of the information refers to 1997/98.

The forest management legislative and policy framework of MNR has been undergoing significant improvements in recent years. The Crown Forest Sustainability Act (CFSA), which came into effect in 1995, requires anyone operating in a Crown forest in Ontario to ensure the long term health of the forest so that all the benefits of Crown forests are available to future generations.

Ministry of Natural Resources has instituted changes affecting the responsibilities of the forest industry, the opportunities for the general public to become involved in forest management planning, the system for licensing forest companies, the fees paid to harvest wood, and the funding for forest renewal (which is now stabilized through mechanisms that provide dedicated funding for renewal).

Ontario's inventoried land covers about 61.5 million hectares, with 40.3 million hectares classed as productive forested lands. The productive forested land on Crown land covers about 34.1 million hectares, with 26.0 million hectares of this area eligible for forestry activities. The focus of this annual report is to provide information on the activities carried out on this 26.0 million hectares. This area is referred to as the Area of the Undertaking (AOU) in the EA Board's decision.

The AOU is now divided into 68 management units (as of April 1, 1999). The CFSA requires that an approved forest management plan be in place for each management unit before any forestry operations take place. A forest management plan covers a 20-year period. It describes the values of the forest in a management unit, as well as the harvesting, renewal, and other forestry-related activities that will take place. A forest management plan is renewed every five years through a process that provides opportunities for public input. In 1998/99 and 1999/00, 20 forest management plans and contingency plans were approved and implemented.

The CFSA provides for two types of licences: Forest Resource Licenses and Sustainable Forest Licenses. In 1998/99, MNR issued a total of 3,874 licences covering a total of almost 27.8 million hectares of productive forest area. Some of these licenses overlap one another, which inflates the total area under licence.

The figures for total harvest by area and volume used in this report are from 1997/98 because data collection on harvesting and other disturbances is not completed until late in a given year. In 1997/98, harvesting activities took place on 222,198 hectares. A total of almost 22.2 million cubic metres of wood was harvested within the AOU. Forest fires occurred on a further 22,694 hectares of productive forest.

The CFSA requires a significant portion of the money paid by forest companies to be designated exclusively for forest renewal activities. In 1998/99, the Government of Ontario received a total of nearly $278.3 million for wood harvested, of which over $120.8 million went directly to funds designated for the maintenance and renewal of the forest, and for work associated with ensuring the future of the forest. In the same period, a total of over $111.5 million was spent on forest renewal activities.

Renewal of the forest occurs both naturally and with assistance. In 1998/99, there was natural regeneration (even and uneven-aged) on 70,859 hectares of land. Assisted renewal occurred on 107,685 hectares. Site preparation activities, such as by mechanical means, chemical spraying, and prescribed burning, took place on another 91,581 hectares. In total, 270,125 hectares of renewal activities were carried out.

Tending and protection activities were conducted to improve the quality and growth of some areas of the forest. During 1998/99, tending and protection activities such as thinning and pest control were carried out on 108,078 hectares of forest.

Forestry operations require a complex system of primary and secondary roads, the cost of which is now borne by forest companies. In 1998/99, 840 kilometres of primary and secondary roads were constructed in Ontario forests to serve management activities. Maintenance work was done on another 15,952 kilometres of road.

This report discusses the efforts of MNR and First Nations communities in MNR districts to respond to Term and Condition #77 of the Timber Class EA decision, and to implement ways of achieving a more equal participation by Aboriginal peoples in the benefits derived from forest management activities.

This is the first annual report of compliance monitoring to provide results of "industry self-monitoring and reporting". The forest industry is required to report the results of their inspection reports to MNR. The MNR conducts inspections to verify all instances of non-compliance reported by companies, as well as to carry out random and planned inspections of forest operations. Of the 5,116 inspections undertaken across the province, 2,932 were conducted by companies and 2,184 were conducted by MNR. The vast majority of the inspections reported compliant operations. A total of 135 remedial actions were required by MNR that ranged from warnings to "stop work" orders, and included administrative penalties.

All management units are audited at least once every five years. In 1998/99, independent forest audits were conducted on three Sustainable Forest Licence Units (Driftwood Forest, Timmins Forest and White River Forest) and three Crown-operated management units (Kenora, Timmins and Pembroke (now Ottawa Valley Forest) Management Units). In all three of the SFL audits, the auditors recommended, or were in support of, licence renewal. On Crown management units, the auditor is not expected to make a recommendation related to licence renewal.

Part of MNR's monitoring responsibilities include assessing the impacts of forestry activities on the forest ecosystem over the long term. The final chapter of this report details policies, procedures, research, and scientific studies that MNR is undertaking to ensure that the guidelines, data, methodologies, and underlying science are available to monitor and manage forest management activities effectively.

Chapter 1

Introduction

Management of Ontario's forests has evolved through past decades from managing for timber to managing for all the values of the forest. With the introduction of the Crown Forest Sustainability Act (CFSA) in 1995, Ontario adopted a policy of managing Crown forests according to the principles of sustainability; that is, to conserve large, healthy, diverse, and productive forests and their associated ecological processes and biological diversity. Forest management has also been guided by the Environmental Assessment Act. In 1988, the Environmental Assessment (EA) Board began an assessment of the Crown land timber management planning process of the Ministry of Natural Resources (MNR), which is responsible for forest management in Ontario. Six years later, after extensive public hearings, the Board released its decision on MNR's Class Environmental Assessment for Timber Management on Crown Lands in Ontario for a large part of the province, referred to as the Area of the Undertaking (AOU). The EA Board approved MNR's planning process for Crown forests with 115 terms and conditions. One of the conditions is that MNR prepare an annual report that provides the legislature and the public with information on Ontario's Crown forests.

This document is the fourth such annual report and covers the period from April 1, 1998 to March 31, 1999. However, the information on disturbances, such as harvesting, forest fires, and insects, is from 1997/98. This is because disturbed areas are mapped and inventoried in the fall of the year in which the disturbances occurred, to allow time to complete the gathering of information. Therefore, the gathering of information on disturbances is completed too late in any given year for the data to be included in a report on activities during that same year. New data, information, errors or omissions noted since the last report are also addressed in this report.

For management purposes, Ontario's Crown forests are now divided into 68 management units (as of April 1999), each of which is managed according to its own 20-year forest management plan. Each plan is renewed every five years through a process established in law. This annual report includes information on the most recent harvesting and renewal activities for the forest as a whole and provides a list of forest management plans in various stages of development to be implemented in1998 to 2002 inclusive, following their approval.

Also included is an overview of the licensing and revenue-generating system for forest management activities. This annual report also presents information about Term and Condition #77 (T & C #77) of the Timber Class EA decision by providing an update on MNR's progress on involving Aboriginal communities in the benefits of forest management.

Forest management activities and their effects are monitored by MNR to ensure that forest management plans are being followed appropriately and to check on the long-term health of the forest. These monitoring systems are explained in this report.

The report concludes with an overview of the ongoing activities and future directions of MNR, as required by the Timber Class EA decision.

With this annual report, MNR is providing information that will help in understanding how Ontario's Crown forests are being managed and provides a baseline of information against which future forest management activities and annual reports can be compared.

Other documents are available that provide information about forest management. They include:

- the Policy Framework for Sustainable Forests, which lays out the principles for managing forests sustainably in Ontario
- MNR's Statement of Environmental Values, which sets out the environmental principles that govern MNR's management of Ontario's natural resources
- the Crown Forest Sustainability Act
- the Forest Management Planning Manual
- the Forest Operations and Silviculture Manual
- the decision of the EA Board on MNR's Class Environmental Assessment for Timber Management on Crown Lands in Ontario, which contains the reasons behind their approval of the forest management planning process and the terms and conditions that the Board set on its approval
- the Forest Resources of Ontario 1996, a snapshot of statistics on the state of Ontario's forests

Ontario's Living Legacy

In March 1999, Premier Harris unveiled Ontario's Living Legacy – the most comprehensive, long-term natural heritage strategy in the province's history. Ontario's Living Legacy features the Ontario Forest Accord – an historic agreement among the forest industry, environmental groups and government to work together to resolve differences over how Ontario's Crown land is used and protected in a vast area of central and northern Ontario.

Within this area, Ontario's Living Legacy added 378 new parks and protected areas totalling 2.4 million hectares. This achieved the internationally recognized protection target of 12 per cent of the land base, an accomplishment matched by few jurisdictions around the world. The total protected area in Ontario increased to 9.5 million hectares – equivalent to all of Ontario south of Algonquin Park.

Ontario's Living Legacy is the direct outcome of the Lands for Life land use planning process launched by Premier Harris in February 1997. During 1997 and the first six months of 1998, regional round tables consisting of citizens from a variety of backgrounds came together to provide the government with ideas on how to manage the Crown lands and resources in an area covering 45 per cent of the province. This was the broadest public consultation on land use ever undertaken in Ontario. More than 65,000 Ontarians responded to Lands for Life and provided valuable input. The suggestions and concerns were consolidated into 242 specific recommendations and published in October 1998.

Chapter 2

Throughout this document, Crown land refers to land that is owned by Ontario for the people of the province and, in general, is managed by MNR. The figures provided in this chapter are from a provincial inventory updated in 1996 and do not reflect changes put into effect by Ontario's Living Legacy program.

The total inventoried land area of the province of Ontario is about 61.5 million hectares, about 40.3 million hectares of which are productive forested lands. The productive forested lands consist of 34.1 million hectares of Crown land, 5.8 million hectares of private land, and 0.4 million hectares of federal land. The Crown productive forested lands are further divided into 26.0 million hectares where forest management activities take place, 3.6 million hectares of parks, recreational reserves and protection forest, and 4.5 million hectares of Crown land outside the AOU.

Ontario's Forest Inventory

Ontario has been inventorying its forests since 1922. Using aerial photographs and field verification, MNR creates the Forest Resource Inventory (FRI) by classifying forest stands and other areas into broad physical categories including productive forest, non-productive forest, non-forested land and bodies of water. Each component is further classified by its ownership and land use. This inventory provides baseline information for management planning and for monitoring the health of the forest. The FRI was used to help prepare this report.

A new inventory is required to be conducted on each management unit approximately every 20 years, and must be updated at the start of each new forest management plan to reflect all changes to the forest (i.e., depletions and accruals) that occurred prior to the commencement of the new plan. Depletions include harvest and natural reductions, such as those caused by wildfire, insects, disease, and blowdowns. Accruals include the results of forest renewal and tending activities for both assisted and naturally regenerated areas.

Figure 1 illustrates all the land classifications within the inventoried area in Ontario. A detailed table of all land classifications within the inventoried area can be found in Appendix 1.

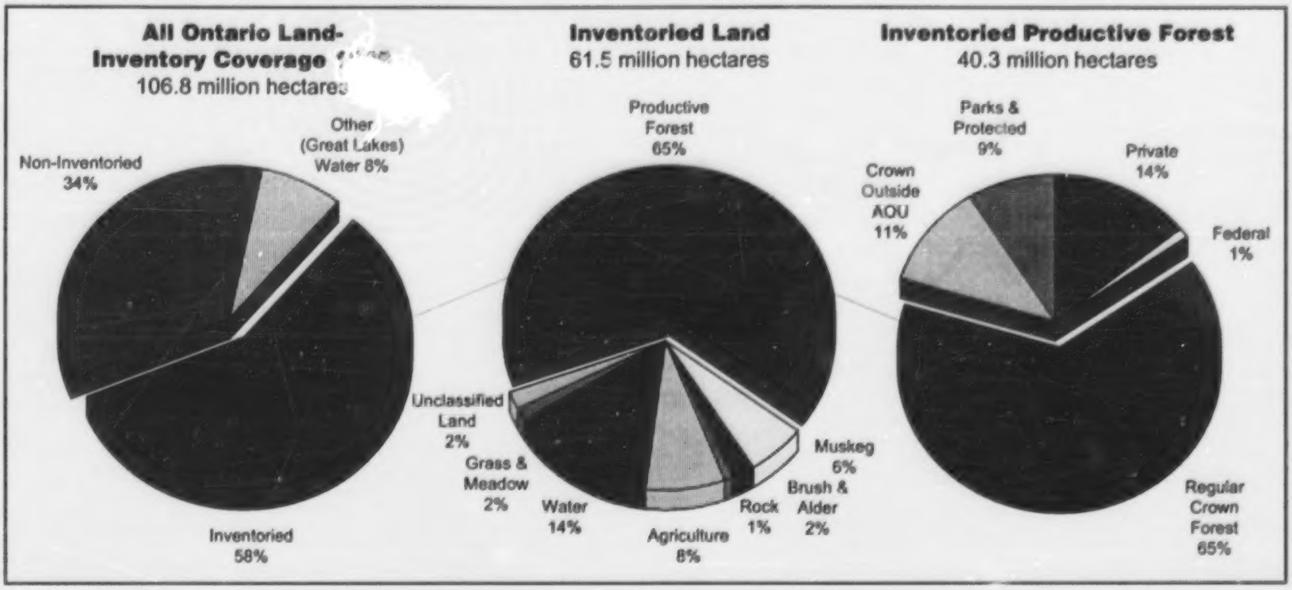


Figure 1

All Land Classifications within Inventoried Area

The Crown, private, and federal portions of the productive forested areas in each of MNR's three administrative regions are shown in Table 1.

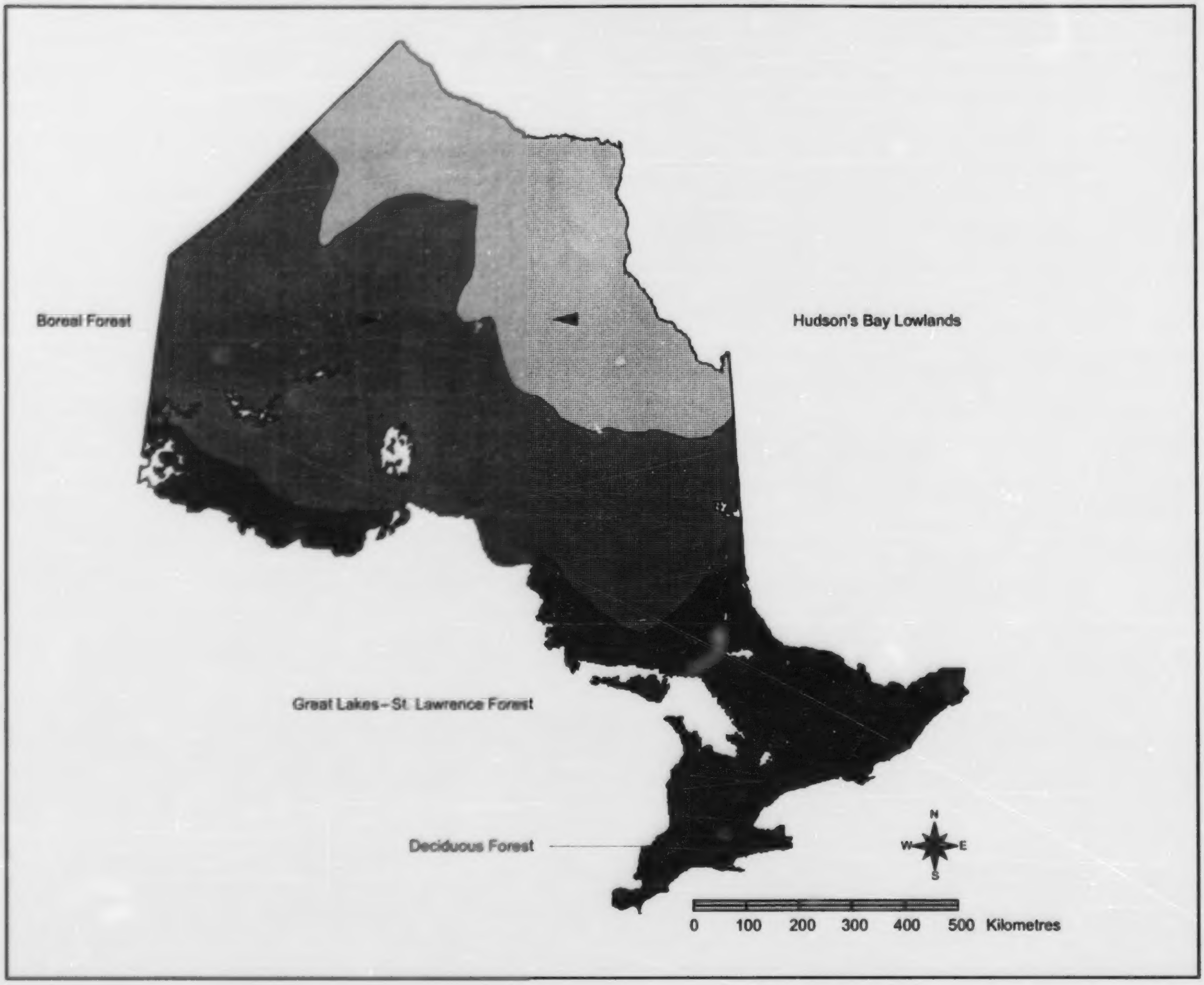
Table 1

Ownership of Productive Forested Lands in Ontario (000's hectares)

Ownership	Northwest Region	Northeast Region	Southcentral Region	Total
Crown	17,370.9	14,909.3	1,859.3	34,139.5
Private	642.1	1,774.4	3,347.6	5,764.1
Federal	158.3	228.2	12.4	398.9
Total	18,171.3	16,911.9	5,219.3	40,302.5

Ontario has three major forest regions: the Deciduous Forest in southern Ontario, the Great Lakes-St. Lawrence Forest in southern and central Ontario, and the Boreal Forest in northern Ontario. Apart from provincial parks, there is little Crown land in southern Ontario.

Each forest region has distinct ecosystems, the extent of which are largely determined by temperature and precipitation ranges; each region also has tree, plant, bird, insect, and other wildlife species characteristic of its type. There are broad zones of natural transition from one ecosystem to another. The forest regions of Ontario are shown in Figure 2.


Boreal Forest
Hudson's Bay Lowlands
Great Lakes - St. Lawrence Forest
Deciduous Forest
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300
400
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Figure 2

Ontario's Forest Regions

The Deciduous Forest is found in the most southern part of the province, mostly in concentrated pockets on private land and within provincial parks on the north shore of Lake Erie. This is the only occurrence of the Deciduous Forest in Canada.

The major deciduous species are sugar maple, beech, basswood, red maple, and several oaks. In the most southern portion of this region, Carolinian species such as tulip tree, cucumber tree, pawpaw, red mulberry, kentucky coffee tree, black gum, sassafras, and redbud are found. Species such as black walnut, sycamore, swamp white oak, shagbark and bitternut hickory, butternut, rock elm, silver maple, and blue ash are largely confined to this region. Conifers such as white pine, cedars, hemlock, spruce, and tamarack occur throughout.

The Deciduous Forest Region is about 3.0 million hectares in size. Less than 15 percent is actually forested, with only about 8,200 hectares of forest (.003 percent) owned by the Crown. More than 75 percent of this forest region is agricultural land. Most of the remaining land is urban.

Human activity in the south has greatly modified the forest, which is now mostly restricted to areas with low agricultural potential. However, forests in this region are among the most productive in the province.

The Great Lakes-St. Lawrence Forest covers a broad band occupying the southern portion of the Precambrian Shield and the limestone area north of the Deciduous Forest. It is characterized by white and red pine, and maple. Other conifers in this region are jack pine, black and white spruce, tamarack, and cedar. The shade intolerant hardwoods found in this region are poplar and white birch. The shade tolerant hardwoods are, in their relative order of occurrence, hard maple, oak, and yellow birch. Other hardwoods such as soft maple, black ash, beech, and basswood can also be found in this region.

In the southern part of the Great Lakes-St. Lawrence Forest, there is a large amount of privately owned forests, which are managed for forest products, recreation, wildlife habitat, and other environmental or socio-economic benefits. In the central and northern part of the region, the land is predominantly owned by the Crown.

The Boreal Forest is a global band of conifer-dominated forest that stretches across Scandinavia, Russia, Alaska, and northern Canada. In Ontario, the Boreal Forest extends from the northern limits of the Great Lakes-St. Lawrence Forest to the Hudson's Bay Lowlands.

The Boreal Forest is characterized by conifers such as jack pine, black and white spruce, and balsam fir, together with deciduous species such as poplar and white birch.

This forest region is by far the largest in the province. Part of the Boreal Forest is further divided into the Hudson Bay Lowlands based on its sub-arctic climate and its low site productivity. Most of the land in the Boreal Forest region is Crown land.

The Boreal Forest is influenced by natural disturbances, such as fires, heavy winds and insects, which can affect large areas of the forest. During the last 80 years, timber harvesting and forest fire prevention efforts have affected the mix of tree species and age of the Boreal Forest in the AOU.

Private Woodlands

Private woodlands, at 5.8 million hectares of productive forest area, comprise 14 percent of the inventoried productive forest area in Ontario. About 43 percent of this area is located in northern Ontario, with the remainder in southern Ontario. In the southwestern portion of the province, private woodlands represent in excess of 90 percent of the total area of woodlands and consequently take on a special significance.

The MNR's commitment to healthy forest ecosystems extends to these private forests, although it does not have the same direct stewardship responsibility as for Crown forests. The Private Woodlands Strategy 1991 outlines how MNR will seek to influence the sustainable management of the province's private woodlands through:

- coordinating the programs and efforts of the many agencies and groups interested in promoting stewardship
- providing education and skills training opportunities for landowners to become more knowledgeable about stewardship
- providing effective policies as incentives to stewardship of woodlands

In 1998/99 MNR continued to implement the Ontario Stewardship Program which started in 1995/96. Led by MNR's 35 Stewardship Coordinators, 40 community stewardship councils consisting of landowners, interest groups, associations and resource management agencies are working together to meet collective community-based stewardship goals. There are about 600 councillors, all of whom are well connected with local land and resource-based organizations. This program provides a forum for:

1. determining and expressing local needs and concerns,
2. improving coordination of resource agency resources and program delivery,
3. enhancing access to information and educational opportunities, and
4. enhancing partnerships, teamwork, respect, and understanding between landowners and those with an interest in the land and its environmental, social, and economic benefits.

In 1998/99, the MNR, in addition to providing the funding for the Stewardship Coordinators, made available grants totaling $500,000 to approximately 39 local councils to assist them in leveraging additional funds to carry out local projects. This support encouraged 620 projects that ranged from conducting workshops on woodland tax and estate planning to best management practices for woodlands, wetlands, and wildlife. The southwestern Ontario councils initiated a computer-based catalogue of demonstration areas, while other councils began the task of preparing a "landscape plan" for their counties. The Extension Note series of landowner-friendly fact sheets continued to grow in support of the stewardship program. New titles, such as "Managing Red Pine Plantations" and "Caring for Ice Damaged Woodlots and Plantations", were added. There are now over 40 titles in this series.

In recognition of the importance of maintaining private woodlands for public benefits, MNR designed and implemented the Managed Forest Tax Incentive Program (MFTIP) in 1997 for implementation in the1998 tax year. This was part of the government's broader property tax reform initiative. The MFTIP is a replacement for the former Managed Forest Tax Rebate Program (MFTRP). The Ontario Woodlot Association and the Ontario Forestry Association are partners in the delivery of this program and handle most of the public inquiries and program administration. The main features of MFTIP are the requirements to have in place a Managed Forest Plan to enter the program, and a reduction in property value assessment leading to lower property taxes. The plans must be approved by a Managed Forest Plan Approver, part of a network of over 120 private consultants who help to maintain the program's standards. In the final year of the MFTRP (1997/98), there were 9,521 properties enrolled, representing 575,144 hectares of the private forest estate. In 1998/99, under MFTIP, the area increased to 687,990 hectares from 6,900 properties. This increase in area and decrease in number of properties is partially explained by the fact that 1998/99 was the first year that land owned by Conservation Authorities was eligible for the program.

Chapte 3

In 1995, the CFSA came into effect which mandates that the province's Crown forests must be managed to ensure they remain large, healthy, diverse, and productive.

Since the CFSA became law, MNR has been active in implementing the requirements of this legislation, which continue to include well-defined management planning for the forest and public participation in the process.

Under the terms of another piece of Ontario legislation, the Environmental Assessment Act, the EA Board reviewed MNR's planning process for Crown forests and approved it, with terms and conditions. Reference is made to many of these in this report.

To handle the management of Ontario's Crown forests, the province is divided into management units. Ministry of Natural Resources requires an approved forest management plan to be in place in each management unit before any forest operations are undertaken. This ensures the long-term health of the forest covered by a plan. A map of Ontario showing the location of all management units is included as Appendix 2. The key to the map identifies the name of the management units and indicates who has forest management planning responsibility (e.g., the Crown (MNR) or a Sustainable Forest License (SFL) holder).

In recent years, there has been an amalgamation of some management units to realize efficiencies and improve implementation. As of April 1999, there were 68 management units and additional amalgamation proposals were being evaluated.

Forest management plans are prepared according to the Forest Management Planning Manual, which directs how planning is to be carried out, monitored, reported on, and evaluated.

All forest management plans have a 20-year perspective and a five-year plan of operations. The five-year plan lays out what may be harvested, how it may be harvested, how harvested forests are to be renewed, and

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what values (such as archaeological sites, wildlife habitat, or recreational facilities), are to be protected.

Plan implementation is monitored by MNR for each management unit to ensure that the plan is followed appropriately. All plans are renewed on a five-year planning cycle. A period of approximately 24 to 27 months is required for the preparation, review, and approval of a forest management plan.

Appendix 3 provides a list of all forest management plans approved for implementation in 1998 and 1999. Appendix 3 also provides, in accordance with the requirements of the Timber Class EA decision for an annual report, the list of forest management plans scheduled for 2000, 2001 and 2002.

The Forest Management Planning Manual

The CFSA requires that forest management plans be prepared and approved following the Forest Management Planning Manual. The manual provides direction on how to determine sustainability and requires that specific information, such as the following, be included in a forest management plan:

- an environmental, social, and economic description of the management unit
- long-term strategic direction for the management of the forest, including how sustainability is measured through the analysis of a range of management alternatives and the selection of the preferred alternative, the determination of areas eligible for operations during the 20-year period of the plan, and the planning of primary access corridors for the 20-year period
- areas of operations, the development of operational prescriptions, and the determination of primary and secondary access road locations for the five-year term of the plan
- a description of the program for monitoring forest management operations, and assessing renewal success
- supplementary documentation requirements, and a forest management plan summary

what values (such as archaeological sites, wildlife habitat, or recreational facilities), are to be protected.

Plan implementation is monitored by MNR for each management unit to ensure that the plan is followed appropriately. All plans are renewed on a five-year planning cycle. A period of approximately 24 to 27 months is required for the preparation, review, and approval of a forest management plan.

Appendix 3 provides a list of all forest management plans approved for implementation in 1998 and 1999. Appendix 3 also provides, in accordance with the requirements of the Timber Class EA decision for an annual report, the list of forest management plans scheduled for 2000, 2001 and 2002.

The Forest Management Planning Manual

The CFSA requires that forest management plans be prepared and approved following the Forest Management Planning Manual. The manual provides direction on how to determine sustainability and requires that specific information, such as the following, be included in a forest management plan:

- an environmental, social, and economic description of the management unit
- long-term strategic direction for the management of the forest, including how sustainability is measured through the analysis of a range of management alternatives and the selection of the preferred alternative, the determination of areas eligible for operations during the 20-year period of the plan, and the planning of primary access corridors for the 20-year period
- areas of operations, the development of operational prescriptions, and the determination of primary and secondary access road locations for the five-year term of the plan
- a description of the program for monitoring forest management operations, and assessing renewal success
- supplementary documentation requirements, and a forest management plan summary

Chapter 4

Forest
Use
Government
Revenue

Ontario's Crown forests provide the forest resources for a diverse number of forest-based industries, including lumber, structural board, pulp, paper, and newsprint. Crown forests also provide opportunities for tourism, recreation, trapping, hunting, fishing, and food production. In addition, service industries and facilities that support forest activities also depend on Crown forests.

In 1997 the forest industry contributed significantly to the economy of Ontario with shipments of more than $15.0 billion. Employment within the forest industry was 165,000. Included in this figure are direct, indirect, and induced jobs. 1998 Statistics Canada figures are not yet available.

Based on the most recent Statistics Canada census (1996), 50 Ontario communities, mostly located in northern Ontario, had at least 20 percent of their labour force employed in the forest industry. Appendix 4 lists these Ontario communities, shows the total labour force for each community and identifies the percentage that worked in the forest sector.

As well as being a major employer, the forest industry annually invests in capital improvements and mill expansions. In 1997, the forest industry had capital and repair expenditures of $1.5 billion.

The Forest Products Industry

The forest products industry is comprised of the logging industry, the wood industries, paper and allied industries, and other related industries such as the manufacture of furniture and fixtures.

The logging industry is made up of both large and small contractors, as well as large, mill-owned operations. The contractors may work independently or directly for company-owned mills.

The wood industries include businesses such as sawmills, veneer mills and structural board plants producing construction materials and specialty wood products. The capital investment in these mills range from a few thousand dollars to several million dollars.

Pulp and paper mills are the largest types of plants for converting timber fibre to forest products. A greenfield pulp mill can cost close to $1.0 billion. Their output represents over 60 percent of the value of all forest product shipments.

Table 2 shows the distribution of various manufacturing activities by sector and direct employment within each sector in 1997/98.

Table 2 Distribution of manufacturing activities by sector and direct employment within each sector

	No. of Establishments		No. of Employees		Total Value Added	
Sector	Number	% of Canadian Total	Number	% of Canadian Total	Value Added ($ Millions)	% of Canadian Total
Logging	1,756	20	6,232	14	597	14
Wood Industries	680	23	28,769	22	1,928	19
Paper & Allied Industries	314	45	35,251	34	4,325	33
Total	2,750	22	70,252	25	6,850	25

Source: Statistics Canada, 1997

The Licensing System

The vast majority of Ontario's forests are harvested by companies or individual operators that hold one of two types of licenses: Forest Resource Licenses (FRLs) and SFLs. The total land under both licence types is shown in Table 3.

Table 3 Crown production forest area under licence 1998/99 by licence type

Licence Type	Number of Licences	Productive Forest Area (hectares)
FRL < 100 ha	3,708	46,090
FRL > 100 ha	98	3,630,930
FRL: Salvage	19	6,960
SFL	49	24,148,100
TOTAL	3,874	27,832,080*

* Although Chapter 2 refers to 26.0 million hectares where forest management activities take place, many FRLs and most salvage licenses are issued on existing SFLs, which inflates the total area under licence.

Forest Management Responsibilities in Ontario

An SFL requires the licensee to prepare forest management plans following the direction of the Forest Management Planning Manual. The licensee is responsible for implementing forest management plans by carrying out access, harvest, renewal, and maintenance activities. The SFL holder must follow the rules and guidelines set by MNR to ensure forests are managed sustainably.

Forest Resource License holders follow forest management plans approved by MNR and must operate in a way that ensures the long-term health of the forest.

Ontario's Stumpage System

In 1998/99, the Government of Ontario received direct payments from the forest industry in the form of royalty or stumpage payments, and indirect payments from taxes.

Forest companies pay a stumpage fee to the Crown for every cubic metre of timber harvested. A market-based pricing system is used by MNR to calculate the stumpage fees that companies and individuals pay for harvesting timber from Crown land to ensure the province receives a fair return for this resource. In times of strong market prices for forest products, the market-based system triggers higher fees. In times of low prices, forest industries pay lower fees.

The Crown's stumpage fees are composed of three Crown charges:

- A minimum charge per cubic metre of harvested timber, regardless of species harvested, that goes into the Consolidated Revenue Fund of the province. The minimum charge was raised by $1.34 from $1.50 to $2.84 per cubic metre on April 1, 1997. This charge is adjusted annually. On April 1, 1998 the minimum charge was raised by $0.01 per cubic metre harvested to $2.85.
- A forest renewal charge to provide dedicated funding for forest renewal. This charge varies depending upon the tree species and the anticipated renewal cost for that species. Forest renewal charges are held in either a Forest Renewal Trust fund or a Forest Renewal Special Purpose Account and may only be used for regenerating and maintaining the health of Ontario's forests.
- A residual value charge, paid to the province's consolidated revenues by forest companies or individuals licensed to harvest timber. The calculation of this charge varies from zero in times of low product prices to about $20.00 per cubic metre in times of high product prices.

The forest industry also pays into the Forestry Futures Trust (FFT) fund through a $0.48 charge per cubic metre of timber harvested. The FFT is managed by an independent committee established by the Crown, and funds projects that meet MNR approved criteria. To qualify, projects must be: a silvicultural activity on Crown land that addresses renewal of trees killed or damaged by fire; renewal of land where a licensee becomes insolvent; forest protection from insect or disease infestation; or intensive stand management related to a critical wood supply.

A special conversion charge of $0.38 per cubic metre of harvest is applied to timber harvested by the larger SFL holders and is also paid into the FFT. 1998/99 is the final year that this charge will be in existence. This charge is used to assist the new, smaller SFLs with costs associated with the establishment of an SFL (e.g., inventory).

Table 4 shows the direct payments from the forest industry to the various government accounts during the last five fiscal years. The Forest Renewal Special Purpose Account will be phased out once all Crown management units, currently under direct management by MNR, have been converted to SFLs.

Table 4

Crown Charge Payments by the Forest Industry ($000s)

Year	Area Charges	Forestry Futures	Consolidated Revenue	Forest Renewal Trust	Forest Renewal SPA (f)	Total Payments
1994-95	14,366.6	6,000 (a)	98,674.8		32,960.7	152,002.1
1995-96	9,905.8	7,121.3 (b)	89,162.2	58,628.6	36,505.5	201,323.4
1996-97	11,269.7	7,861.4	111,669.0	51,628.9	34,755.1	217,184.1
1997-98	(c)	10,576.7 (d)	178,063.2	52,373.5	44,159.0	285,172.4
1998-99		20,605.3 (e)	157,452.3	71,298.9	28,930.8	278,287.3

(a) Initial contribution by MNR
(b) For the period February 7, 1995 to March 31, 1996
(c) Area charges are no longer collected separately. Area charges were incorporated into the minimum charge which is part of the funds payable to the Consolidated Revenue Fund.
(d) Includes conversion funds of $4,428,900 collected in 1997-98
(e) Includes conversion funds of $8,418,167 collected in 1998-99
(f) Amounts are as of March 31, 1999

Note: Funds in the Forest Renewal Trust, the Forest Renewal Special Purpose Account, and the FFT are not formally counted as revenue by the province, although funds in the Forest Renewal Special Purpose Account are held in the province's Consolidated Revenue Fund.

Chapte 5

Forest management attempts to regulate or adapt to "disturbances" within the forest caused by natural (e.g., insects, disease, weather calamities, forest fires) and human (e.g., harvesting) activities. These disturbances are numerous and occur throughout the forest life cycle, illustrated in Figure 3.

Disturbances are measured in terms of forest area (hectares) and volume (cubic metres) of trees killed, damaged or harvested. The degree to which a forest stand must be impacted by these disturbances before the inventory description is changed is a subjective decision. The change in volume and area in a forest stand that results from natural mortality every year is not usually significant enough to be recorded for inventory update purposes. For example, chronic diseases such as root rot may kill only a few trees scattered throughout the forest stand. Therefore, no area loss is recorded for this disease but an estimate of the volume of wood in the dead trees and volume of growth loss in the remaining live trees will be made. The most significant disturbances are reported in the fall of the year following

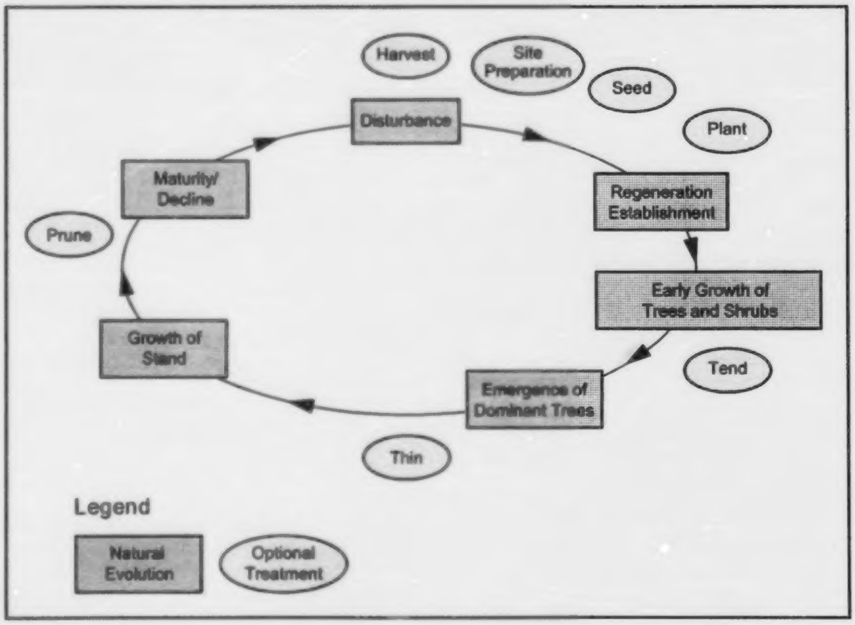

Harvest
Site Preparation
Seed
Plant
Disturbance
Maturity/ Decline
Regeneration Establishment
Prune
Early Growth of Trees and Shrubs
Growth of Stand
Tend
Emergence of Dominant Trees
Thin
Legend
Natural Evolution
Optional Treatment

Figure 3

The Forest Life Cycle

a disturbance. Thus, the most recent disturbances reported in this 1998/99 report actually occurred during 1997/98. Reporting is delayed to allow time to completely map and inventory all disturbances that occurred during a given year.

Harvesting

The level of allowable harvest in a management unit is determined through the forest management planning process. Ministry of Natural Resources requires that the allowable harvest for a management unit be set at a level that will sustain a healthy forest over time. Harvesting in each management unit is controlled and monitored according to the approved forest management plan. These plans specify both allowable harvest area and the associated volumes. However, control of the allowable harvest is by area.

Silvicultural Systems Used in Ontario

Harvesting in Ontario is one of a series of actions that, when combined, represents a silvicultural system. Silvicultural systems combine harvesting, forest renewal and tending and are classified according to the method of harvesting. Ontario uses three silvicultural systems:

Clearcut System

The entire merchantable growth is harvested in one operation, with or without leaving seed trees. Harvesting may be done in blocks, strips, or patches. Regeneration can be natural or assisted. This method will produce stands in which all the trees are at about the same period of growth, or age-class, and is referred to as even-aged management.

Shelterwood System

Mature trees are harvested in a series of two or more cuts to encourage natural regeneration under the residual trees. This may be done by cutting uniformly over the stand area or in groups or narrow strips. This method also produces stands in which the trees are approximately the same age.

Selection System

Mature, unhealthy, or undesirable trees are continuously removed individually or in small groups over an entire area, over the forest life cycle. This method produces stands in which trees are of different ages and is referred to as uneven-aged management.

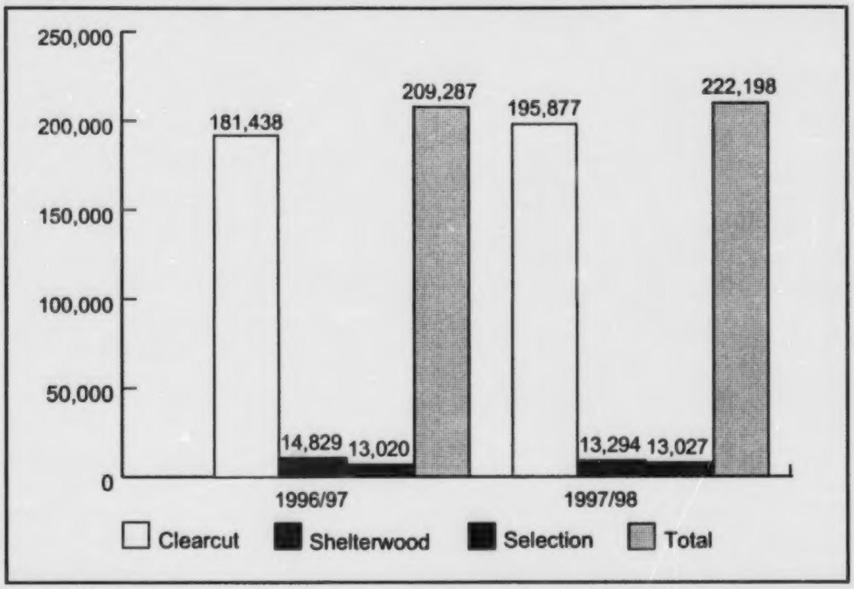


Figure 4

Harvest Area (hectares) by Silvicultural System (1996-1998)

The breakdown of the total provincial area harvested in 1996/97 and 1997/98 by the three silvicultural systems is illustrated in Figure 4. This figure shows that the overall total harvest area increased in 1997/98 from 1996/97 by about 12,900 hectares, predominately in the area managed using the clearcut silvicultural system. Part of the increase was caused by increasing amounts of salvage harvesting. When large areas are burned or destroyed by windthrow or insects, forest companies often harvest some of the dead and damaged wood remaining on these sites. In 1997/98, about 8,300 hectares were salvaged while in 1996/97 there were about 4,500 hectares salvaged.

Figures 5 and 6 show provincial harvest areas and volumes, including fire and other disturbances, from 1993 to 1997. The annual area and volume harvests were at their lowest level in 1993 and were greatest in 1997. The low harvest level reported in 1993 was primarily due to reduced demand for forest products caused by the recession. Since then, demand for products and harvest levels have rebounded and continue to reflect changing market conditions. Comparisons of natural and human disturbances to the forest over the five year period from 1993 to 1997 are also shown in Figures 5 and 6.

Figure 5

Forest Area (hectares) Disturbed by Harvest and Fire for all Crown Land (1993-1997)

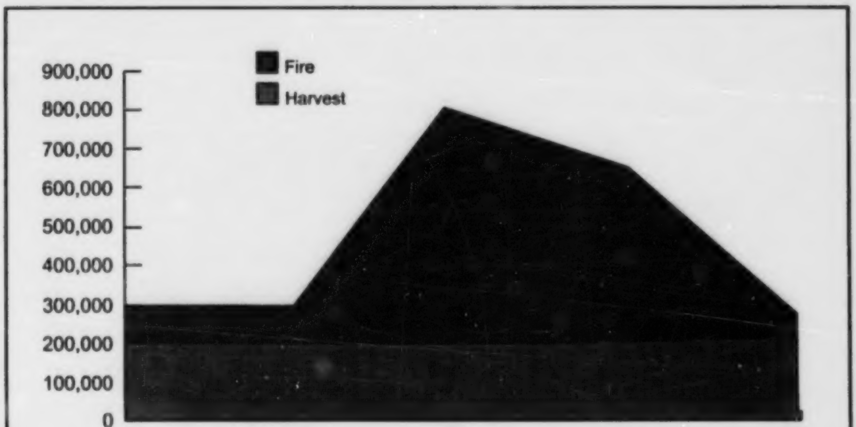
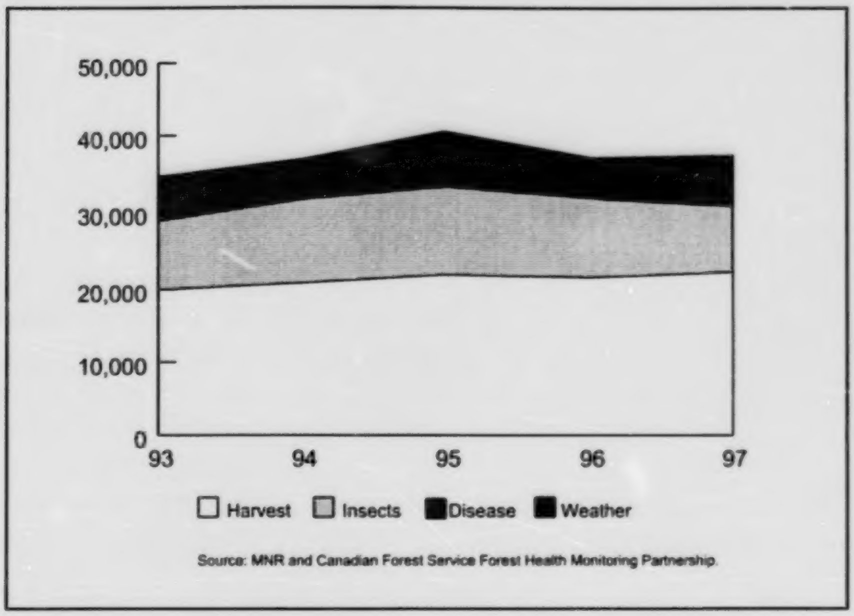


Figure 6

Wood Volume ('000's m³) Harvest and Other Disturbances for the AOU (1993-1997)

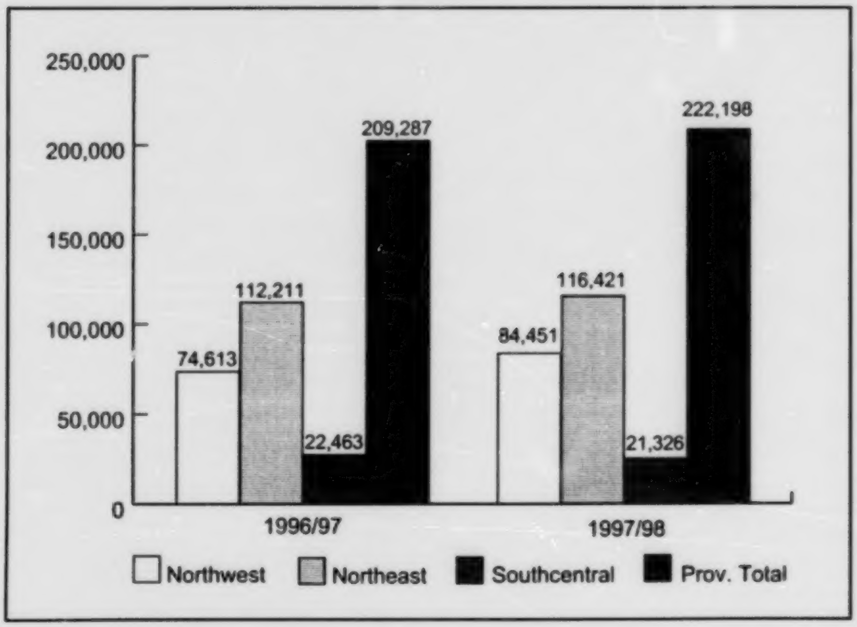


Source: MNR and Canadian Forest Service Forest Health Monitoring Partnership.

Figure 7 shows the total area harvested in 1996/97 and 1997/98 by MNR administrative region. The total provincial harvest area of 222,198 hectares increased by about six percent from 1996/97 to 1997/98. The largest regional harvest area was in Northeast Region (116,421 hectares), representing approximately 52 percent of the total. The Northwest Region had the second largest regional harvested area at 84,451 hectares, or 38 percent of the total. The Southcentral Region, which has a much smaller

Figure 7

Area harvested (hectares) by MNR Region (1996-1998)



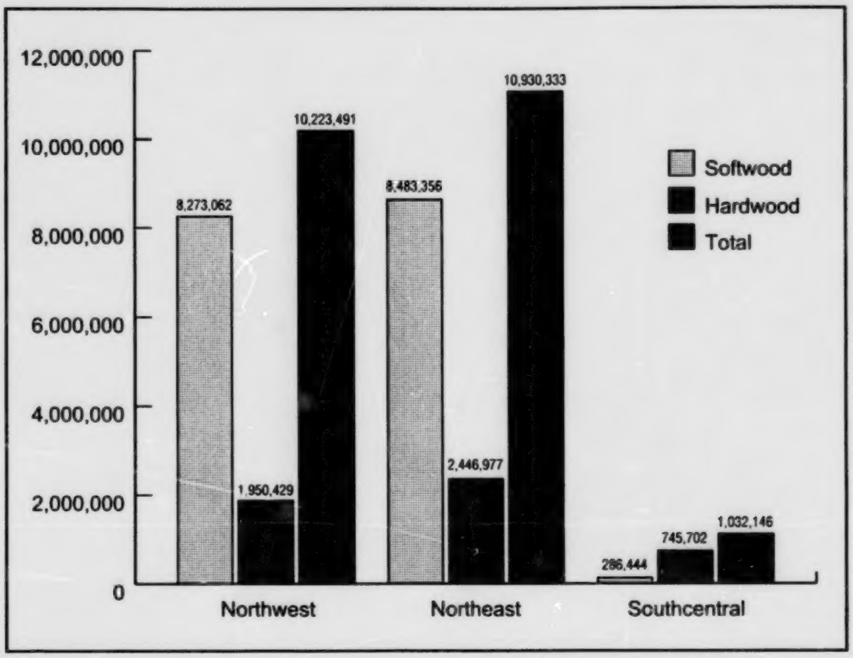


Figure 8

Wood Volume Harvest (m^3) by MNR Region and Species Group (1997/98)

forest area, had the smallest total harvest at 21,326 hectares, or 10 percent of the total. The regional breakdown of the harvest changed very little from 1996/97 to 1997/98.

Wood volumes harvested in 1997/98 in MNR's three administrative regions are shown in Figure 8. Total provincial softwood and hardwood volumes harvested in 1996/97 and 1997/98 are shown in Figure 9.

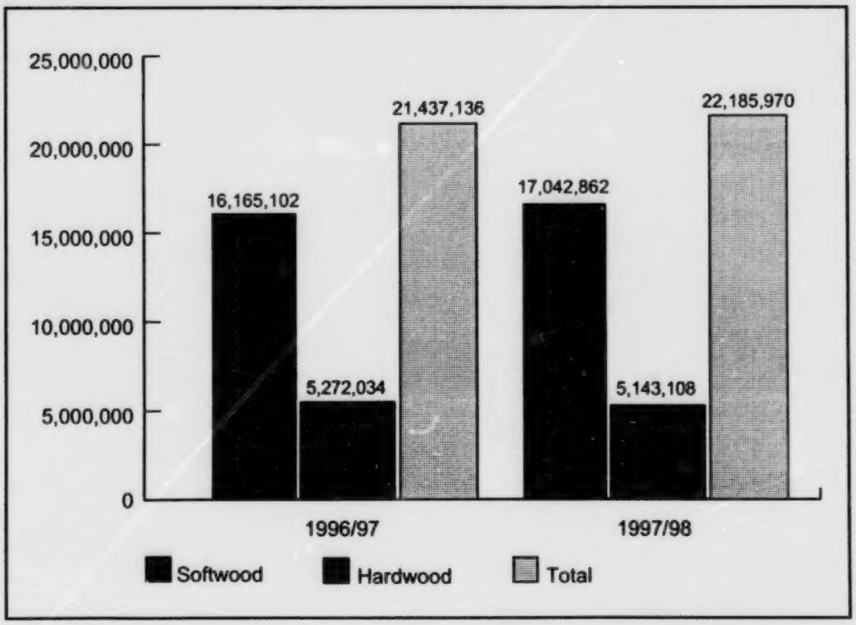


Figure 9

Hardwood and Softwood Volumes Harvested (m3) on all Crown Land (1996-1998)

In 1997/98, the total provincial harvest volume was approximately 22.2 million cubic metres. The 1997/98 regional total harvest volumes were:

- Northwest Region — 10.2 million cubic metres (46 percent of the total harvest volume)
- Northeast Region — 10.9 million cubic metres (49 percent of the total harvest volume)
- Southcentral Region — 1.0 million cubic metres (5 percent of the total harvest volume)

Softwood tree species, accounted for 77 percent of the total harvest volume with a total harvest of over 17.0 million cubic metres. This is a 5 percent increase over the 1996/97softwood harvest. The 1997/98 regional softwood harvest was:

- Northwest Region — 8.3 million cubic metres
- Northeast Region — 8.5 million cubic metres
- Southcentral Region — 286,444 cubic metres

The total provincial hardwood harvest volume of over 5.1 million cubic metres accounts for 23 percent of the total harvest volume. This is a two percent decrease from the 1996/97 hardwood harvest. The1997/98 regional harvest volumes for hardwoods were:

- Northwest Region — 2.0 million cubic metres
- Northeast Region — 2.4 million cubic metres
- Southcentral Region — 745,702 cubic metres

Ontario's forest harvest in 1997/98 was approximately 22.2 million cubic metres, which represents approximately a 3 percent increase over the 1996/97 harvest volume. This increase is mainly due to increases in the harvest of spruce (mostly black spruce), other softwood, and balsam fir species. Fluctuations in the harvest volumes of individual tree species from year to year is in large part due to changes in market demand and variations in the species encountered on the areas to be harvested. The harvest volumes by species for 1996/97 and 1997/98 are shown in Table 5.

Table 5
Provincial Harvest Volume (cubic metres) by Species (1996-1998)

Softwood Species	1996/97 Harvest	1997/98 Harvest
White Pine	408,440	400,378
Red Pine	202,250	212,210
Jack Pine	6,439,813	6,249,545
Spruce	8,561,823	9,311,204
Hemlock	9,075	11,845
Balsam	526,122	642,314
Cedar	4,124	5,950
Tamarack	8,536	15,108
Other Softwoods	4,918	194,308
Total Softwoods	16,165,102	17,042,862
Hardwood Species		
Maple	493,242	544,081
Yellow Birch	41,228	51,754
White Birch	209,387	238,855
Oak	18,638	22,950
Beech	30,280	34,264
Poplar	4,399,774	4,168,609
Basswood	12,999	13,730
Ash	3,680	3,297
Other Hardwoods	62,807	65,568
Total Hardwoods	5,272,034	5,143,108
Provincial Totals	21,437,136	22,185,970

Average and Maximum Size of Clearcuts

The CFSA promotes "using forest practices that within the limits of silvicultural requirements, emulate natural disturbances and landscape patterns while minimizing adverse effects on plant life, animal life, water, soil, air, and social and economic values, including recreational values and heritage values". The document entitled "Forest Management Guidelines for Retaining Forest Ecosystem Structure and Function: The Fire Simulation Guidelines" is under development and will provide consistent direction for considering natural disturbances and landscape patterns. The Timber Class EA decision provides for a range of clearcut sizes, not to exceed 260 hectares, unless supported by biological or silvicultural reasons.

Efforts to prepare plans consistent with the CFSA requirements to "emulate natural disturbances and landscape patterns" have resulted in generally larger planned, and subsequently actual, clearcuts. As these plans are implemented, average clearcut and maximum clearcut sizes are expected to increase.

Cut patterns, sizes, and distribution are developed based on 29 guidelines in accordance with natural conditions, historical disturbance and landscape patterns, forest types, silvicultural characteristics of tree species, and fish and wildlife habitat needs. When appropriate, forestry operations within cut blocks are further altered or prohibited to protect identified site-specific forest values by implementing measures (e.g., reserves and harvest restrictions) specified in the guidelines.

In this report, the area statistics for average and maximum size clearcuts generally refer to the area cut in a particular year, without consideration of harvests in previous years or nearby clearcuts.

Boreal Forest

Key guidelines used to design clearcut sizes and patterns within the Boreal Forest include: "Timber Management Guidelines for the Provision of Moose Habitat" and "Forest Management Guidelines for the Conservation of Woodland Caribou: A Landscape Approach."

The provision of moose habitat includes direction for range management and specific management for values such as aquatic feeding areas. In the northwestern part of the province, in locations where significant woodland caribou populations occur, application of the woodland caribou guidelines takes precedence over moose habitat guidelines for determination of clearcut size.

In 1997/98, 29 management units within the Boreal Forest reported average clearcut sizes from 29 to 175 hectares. One unit reported an exceptional average size of 479 hectares. Maximum clearcut sizes reported ranged from 59 to 555 hectares, with one unit reporting a maximum of 2,119 hectares.

Great Lakes-St. Lawrence Forest

The provision of deer habitat, including shelter and food sources, particularly for winter concentration areas, is a key consideration when designing harvest sizes and patterns in the Great Lakes-St. Lawrence Forest. The silvicultural characteristics of the tree species in this region and the habitat requirements for deer normally result in relatively small harvest blocks. Approximately 25 percent of the harvested areas are cut using the clearcut method, 30 percent use the shelterwood method, and the remainder are harvested by the selection system.

In 1997/98, 13 management units within the Great Lakes-St. Lawrence forest reported average clearcut size ranges from 5 to 61 hectares. Maximum clearcut sizes reported ranged from 5 to 239 hectares.

Natural Disturbances

Natural disturbances include fire disturbances and damage from insects, disease and severe weather conditions. The intensity of disturbances varies from year to year.

Forest Fires The number and size of forest fires varies dramatically from year to year, depending on the weather. This is clearly indicated in Figure 5. Ministry of Natural Resources records the area disturbed due to forest fires across all the forested area of the province, not just for the AOU as is the case for harvest depletions. During the period 1993-1997, annual fire disturbances peaked in 1995 at more than 590,000 hectares of forest. The smallest annual area disturbed by fire in that period occurred in 1997 when 60,433 hectares was burned.

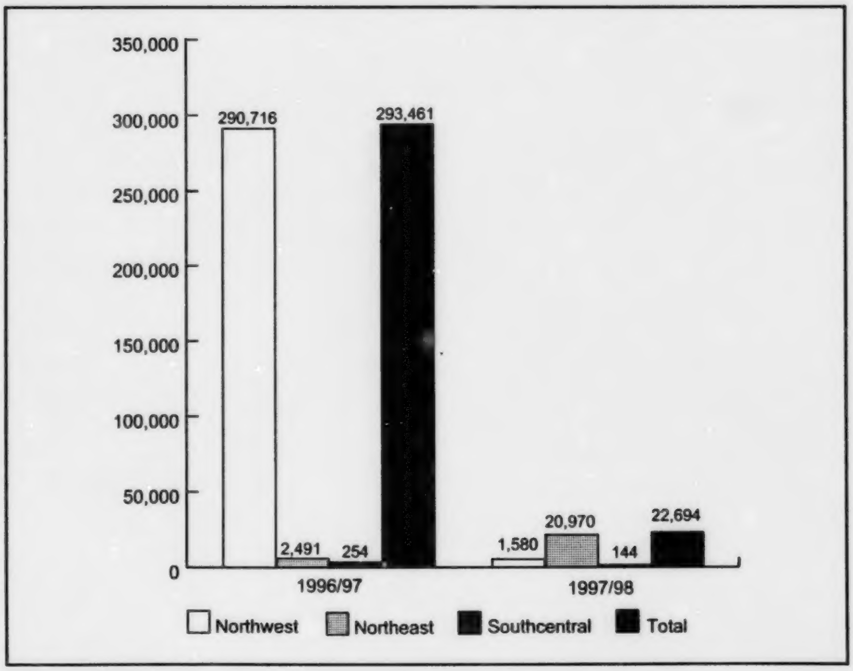
The total fire disturbance for 1997/98 within the AOU amounted to 22,694 hectares. This represents about 38 percent of the total provincial forest area burned that year. The other 62 per-cent occurred outside the AOU, mostly in the far north.

Depending on the severity of the damage to trees from fire, it is often possible to conduct salvage operations to harvest killed or damaged trees. Salvage operations are reported as harvesting.

Figure 10 shows the area disturbed by forest fires during 1996/97 and 1997/98 in the AOU by administrative region. Total area burned in 1997/98 decreased to 22,694 hectares from 293,461 hectares in 1996/97. Ninety-two percent of the area burned within the AOU in 1997/98 was within the Northeast Region.

Figure 10

Area Disturbed by Forest Fire (hectares) by MNR Region (1996-1998)



Insects, Disease, Severe Weather Estimates of volumes lost from 1993 to 1997 due to insects, disease and severe weather are shown in Figure 6. These estimates pertain to Crown production forest within the AOU only. This figure shows that insect losses were at their lowest in 1997 (over 8.6 million cubic metres) and at their highest in 1995 (over 11.8 million cubic metres). The magnitude of these losses has not been adjusted to reflect abnormal impacts from losses which have always been a part of natural forest growth and succession.

The volume losses due to tree mortality caused by insects, disease, and severe weather (e.g., drought, windstorm) shown in Figure 6 are based on studies done for the years 1988 to 1997 by the Forest Health Monitoring Unit of the Canadian Forestry Service and MNR. Mortality and growth losses in surviving trees are included in the estimates. Depending on the severity of damage to trees from insects, disease, or severe weather, it is often possible to conduct salvage operations to harvest timber and reduce the threat of forest fires.

The wood volumes estimated to have been lost in 1996/97 and 1997/98 by natural causes are given in Table 6.

Table 6

Estimated Wood Volumes Lost to Natural Causes on Crown Production Forest Within the AOU

Disturbance Type	1996/97 Volume Losses (cubic metres)	1997/98 Volume Losses (cubic metres)
Insects	10,686,800	8,646,500
Disease	5,466,400	5,466,400
Severe Weather	5,500	1,483,400
Total	16,158,700	15,596,300

Insect Damage The damaged area and volume loss caused by the most destructive insects are based on estimates of forested areas on which 30 percent or more of the foliage was removed. Usually, a number of years in which defoliation occurs is required to kill a tree; this varies for each pest, the tree species being attacked and other factors. Insects that do significant damage to Ontario's forests include the spruce budworm, the jack pine budworm, the forest tent caterpillar, and the gypsy moth. The estimated volume losses in 1996/97 and 1997/98 due to mortality and growth losses for each of these insects are given in Table 7.

Table 7

Estimated Volume Losses by Insect Species

Insect	1996/97 Volume Losses (cubic metres)	1997/98 Volume Losses (cubic metres)
Spruce Budworm	9,934,900	8,088,700
Jack Pine Budworm	53,800	25,200
Forest Tent Caterpillar	251,600	422,000
Gypsy Moth	400	0
Total	10,240,700	8,535,900

Forested areas may be defoliated by more than one insect. Area reported as defoliated may include different degrees of severity.

Diseases Losses due to disease are shown to be a consistent 5.5 million cubic metres over the period because these losses are normally chronic and are estimated by calculating an annual average loss for all chronic diseases over the period studied (i.e., 1988-1997). The estimate of volume loss caused by chronic disease damage shown in is an annualized average based on estimates of mortality and growth loss caused by root rot, stem decay and foliage dieback.

Severe Weather The most common weather disturbances causing significant tree mortality and volume losses are windstorms (damage is commonly referred to as "blowdown") and drought. Reported severe weather volume losses from 1993 to 1995 were caused by drought. Weather-related volume losses were less than 100,000 cubic metres from 1993 to 1994, then peaked in 1995 through 1997. The maximum annual estimated loss from 1995 to 1997 was 1.8 million cubic metres. The large drought volume losses reported in 1995 occurred in the northern part of North Bay District and the southern part of Nipigon District. In 1997, the drought spread to Sioux Lookout, Red Lake, and Fort Frances Districts in the Northwest Region, Sault Ste. Marie District in the Northeast Region, and was widely dispersed throughout Pembroke, Parry Sound, Bancroft, and Algonquin Park Districts in the Southcentral Region.

Windstorms occur periodically but must affect a sizable area in order to be recorded. The areas reported as being damaged by windstorms in 1996/97 and 1997/98 are shown in Figure 11, by administrative region. The total area damaged in 1997/98 was about 579 hectares, which was a significant decrease from the total of 3,319 hectares reported in 1996/97. These figures were reported by individual management units and are not part of the volume estimates provided by the forest health surveys.

M121

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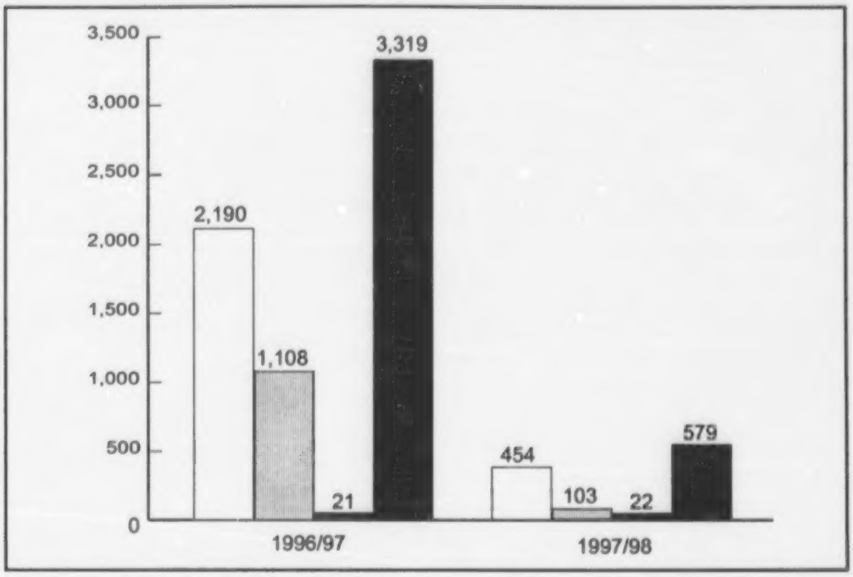
Figure 11

Windstorm Damaged Area (hectares) by MNR Region (1996-1998)

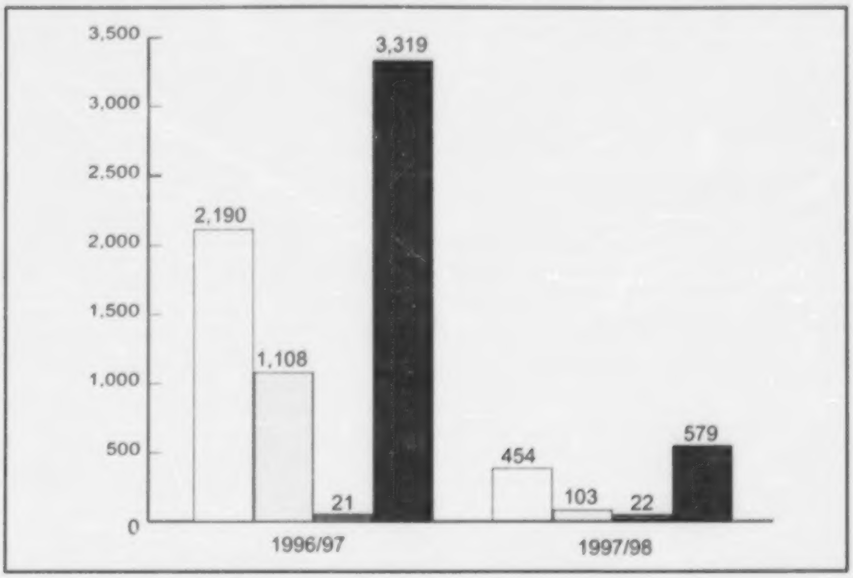


The Ice Storm of 98

In January 1998, the worst ice storm in recent memory swept across eastern Ontario, leaving downed power lines and a broken and heavily-damaged forest in its wake. From January 4 to 9, freezing rain continually blanketed eastern Ontario; in some areas, as much as 3.5 inches of rain fell in a 24-hour period. Woodlots that contained early successional species such as trembling aspen, hybrid poplar, and white birch suffered severe damage. The damage to the other hardwoods was variable and patchy. Some stands were completely stripped of their fine and main branches while other areas suffered relatively little damage. The extent of the damage to conifers varied from species to species, hitting red pine plantations and eastern white cedar the hardest. Eastern white pine, white spruce, and balsam fir suffered relatively little damage. In total, approximately 800,000 hectares of forest were damaged by the ice storm.

Details of the ice storm damage will be reported in the 1999/2000 annual report.

Figure 11
Windstorm Damaged Area (hectares) by MNR Region (1996-1998)



The Ice Storm of 98

In January 1998, the worst ice storm in recent memory swept across eastern Ontario, leaving downed power lines and a broken and heavily-damaged forest in its wake. From January 4 to 9, freezing rain continually blanketed eastern Ontario; in some areas, as much as 3.5 inches of rain fell in a 24-hour period. Woodlots that contained early successional species such as trembling aspen, hybrid poplar, and white birch suffered severe damage. The damage to the other hardwoods was variable and patchy. Some stands were completely stripped of their fine and main branches while other areas suffered relatively little damage. The extent of the damage to conifers varied from species to species, hitting red pine plantations and eastern white cedar the hardest. Eastern white pine, white spruce, and balsam fir suffered relatively little damage. In total, approximately 800,000 hectares of forest were damaged by the ice storm.

Details of the ice storm damage will be reported in the 1999/2000 annual report.

Chapte

6

Under the terms of the CFSA, forest managers have the responsibility to fully renew the forests where they operate. Forest Managers including Sustainable Forest License holders are required to ensure that areas harvested are renewed to specific silvicultural standards as established in forest management plans, to ensure the long term health of Crown forests.

Renewal

Activities needed to ensure the successful regeneration of all harvested areas are specified in all approved forest management plans in Ontario. Crown forests are renewed by both assisted and natural regeneration techniques, and these activities are reported annually.

The two most common types of assisted regeneration are planting and seeding. Planting includes planting of bareroot seedlings, container seedlings, or cuttings. Seeding may be done directly from aircraft or by broadcast seeders on the ground. Renewal activities also include preparing an area disturbed by harvest or natural causes for regeneration through mechanical or chemical means, or by a prescribed burn. The time period from harvest to completion of the planting or seeding may be up to five years, and is often referred to as the regeneration establishment period.

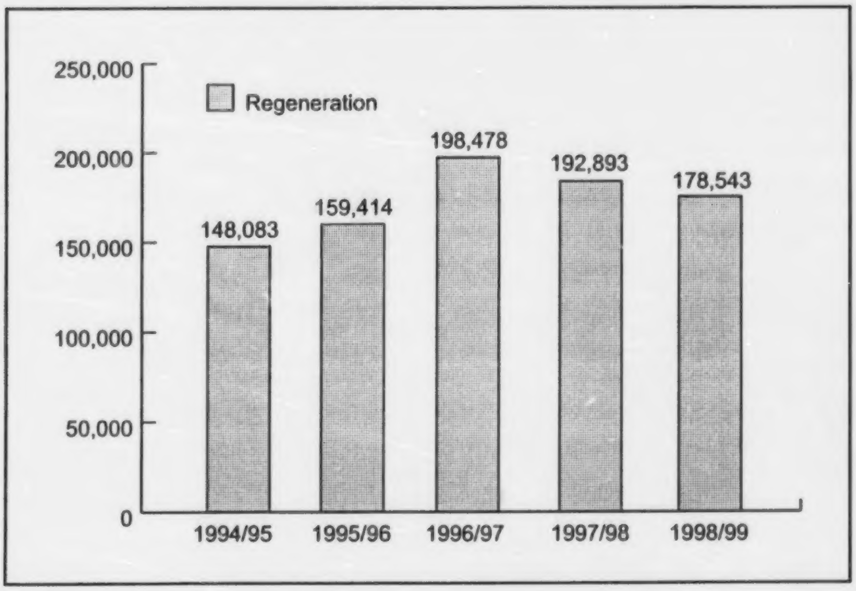
Many tree species can re-establish themselves on a site without planting or seeding. These natural mechanisms include seeding from the adjacent forest, suckering of stumps and roots, and growth of young trees remaining on the harvested area. This natural regeneration can be enhanced through careful selection of the silviculture system and harvest method (see Chapter 5) and commences immediately after harvesting is complete.

In the past, reporting of natural regeneration annually at the time of harvest was not emphasized because some forest managers preferred to report it periodically after regeneration surveys had been completed. This delay in reporting, plus the regeneration establishment period, has resulted in the reported annual renewal levels being substantially less than the reported annual harvest levels. In 1996, new reporting procedures came into effect that require natural regeneration to be reported promptly upon completion of the harvest.

Reported levels of regeneration (including both natural and assisted regeneration) over the years 1994/95 to 1998/99 are shown in Figure 12. Regeneration levels tend to follow fluctuations in harvest and, to a lesser degree, forest depletions from natural causes such as forest fires and insect epidemics. The total area harvested remained about the same from 1993/94 to 1996/97, and increased slightly in 1997/98 to 222,198 hectares, as shown in Figure 5. Regeneration levels increased from 1994/95 to 1995/96, reached their maximum in 1996/97 and then declined slightly in 1998/99 to a level of 178,544 hectares.

Comparison of reported harvest and regeneration levels on an annual basis is not appropriate because of the regeneration establishment period and the reporting delay. Comparison of average harvest and regeneration levels over a five-year period is more appropriate, but it will require several years before the new reporting requirements in Ontario make this comparison meaningful. The information is included here for baseline tracking purposes. The average total provincial harvest area over the five-year period from 1993/94 to 1997/98 was approximately 211,000 hectares. The average total provincial regeneration level over the five-year period from 1994/95 to 1998/99 was approximately 175,000 hectares, or about 17 percent less than the average harvest level. More complete

Figure 12
Provincial Forest Regeneration (hectares) 1994-1999



reporting requirements should result in regeneration levels growing closer to harvest levels over the next few years.

Table 8 summarizes the renewal operations conducted on Crown land in 1998/99 for the province and for each MNR region. The area renewed in 1998/99 includes areas harvested and burned in 1997/98 or earlier.

The area of natural regeneration reported was significantly lower in 1998/99, but assisted artificial regeneration activities, such as planting and seeding, were considerably higher compared to the previous year. The use of bareroot seedlings further decreased in 1998/99, and made up only 10 percent of the total planting activity in the province. Container stock was used in the other 90 percent of the program. The total number of seedlings planted in 1998/99 was about 134.0 million trees, which was a 23 percent increase over 1997/98 levels. The area planted also increased from 1997/98 to 1998/99 by about 15 percent to 84,704 hectares. This was partly due to efforts to replant larger areas burned by wildfires in the three-year period from 1995/96 to 1997/98.

The selection cutting shown in Table 8 was carried out in tolerant hardwood stands in the Southcentral and Northeast Regions. Clearcutting took place mainly in jack pine, black spruce, poplar and white birch stands in the Northeast and Northwest Regions. Strip cutting was carried out mostly in black spruce stands in the Northwest Region and the seed tree system was primarily applied in white pine stands in the Northwest and Northeast Regions. Uniform shelterwood was used mainly in both white pine and tolerant hardwood stands in the Northeast and Southcentral Regions.

Jack pine is the main species used for seeding, most of which was done in the Northwest Region and, to a lesser extent, in the Northeast Region. The overall seeding levels were slightly lower in 1998/99 than in 1997/98. Mechanical site preparation is the main method used in all regions. Although the use of prescribed burning to site prepare cutovers declined in 1998/99, the burning of roadside slash piles increased in 1998/99, mainly in the Northeast Region. This was done to bring landings used for piling trees back into forest stands that may otherwise have remained unregenerated. The total area site prepared in 1998/99 was slightly less than in 1997/98.

M121

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Table 8
Provincial Renewal Operations
(1998/99)

REGENERATION	Northwest	Northeast	Southcentral	Total
UNEVEN-AGED MANAGEMENT				
Selection cut (hectares)		4,241	8,450	12,691
Total uneven-aged management	0	4,241	8,450	12,691
EVEN-AGED MANAGEMENT				
Natural regeneration (hectares)				
Clear cut	7,245	36,275	1,453	44,973
Strip cut	945	100		1,045
Seed tree cut	461	2,844	16	3,321
Uniform shelterwood cut		3,858	4,971	8,829
Subtotal natural regeneration	8,651	43,077	6,440	58,168
Assisted (artificial) regeneration				
Planting (hectares)	42,066	41,142	1,496	84,704
Trees(000's)				
Bareroot	9,102	3,756	219	13,077
Container	57,754	61,909	1,331	120,994
Cuttings	0	0	0	0
Seeding (hectares)				
Direct	12,157	5,490	6	17,653
With site preparation	3,269	587		3,856
Scarification (hectares)	83	117	1,272	1,472
Subtotal Assisted Regeneration (hectares)	57,575	47,336	2,774	107,685
TOTAL REGENERATION (hectares)	66,226	94,654	17,664	178,544
SITE PREPARATION (hectares)				
Mechanical	44,381	33,271	1,284	78,936
Chemical	5,755	6,237	139	12,131
Prescribed burn	322	130	62	514
TOTAL SITE PREPARATION (hectares)	50,458	39,638	1,485	91,581
TOTAL RENEWAL ACTIVITIES (hectares)	116,684	134,292	19,149	270,125

Bareroot stock: **a seedling with its roots bare of the initial growing medium at the time of planting.**

Site preparation: **disturbance of the forest floor, upper soil horizons and vegetation to create suitable conditions for assisted regeneration by mechanical or chemical means, or by prescribed burning.**

Scarification: **mechanical preparation of a site for natural regeneration.**

Prescribed burn: **the knowledgeable application of fire to a specific land area to accomplish predetermined resource management objectives.**

Cleaning: **a manual, mechanical or chemical operation in a young stand to reduce, eliminate or suppress undesirable competing vegetation. Cleaning promotes survival and growth in desirable trees by removing competing vegetation of similar age that may overtop them or are likely to do so.**

Tending and Protection

Forest tending operations are carried out to improve the survival, growth or quality of a regenerating forest. Tending may be done in young stands to help attain Free-To-Grow (FTG) status. Tending may also be conducted in uneven-aged stands to maintain the desired age-class distribution and volume. Protection operations prevent or manage the damage caused by insects and diseases.

Table 9 summarizes the tending and protection activities conducted on Crown land in 1998/99 for the province and for each MNR region. Reported levels of tending were up seven percent in 1998/99 from 1997/98.

Table 9

Provincial Tending and Protection Activities for 1998/99 (hectares)

TENDING (hectares)	Northwest	Northeast	Southcentral	Total
Cleaning				
Manual	614	1,241	2,356	4,211
Chemical -ground	3,789	1,485	534	5,808
Chemical - aerial	29,031	45,593	801	75,425
Mechanical	126	319		445
Spacing, Precommercial Thinning, Improvement Cutting (hectares)				
Even-aged	11,647	2,617	1,412	15,676
Uneven-aged		660	5,779	6,439
TOTAL TENDING	45,207	51,915	10,881	108,003
PROTECTION (hectares)				
Accelerated Harvest				
Salvage			65	65
Manual Protection				
Ground Insecticide			10	10
Aerial Insecticide				
TOTAL PROTECTION	0	0	75	75

Improvement cutting: the elimination or suppression of less desirable trees in favour of more desirable trees, typically in a mixed, uneven-aged stand.

Thinning: a cutting made in an immature stand to accelerate growth of the trees left uncut. The goal is to foster quality growth.

Commercial thinning: removing trees from a developing young stand, so that the remaining trees will have more growing space, dead and dying trees will be salvaged, and the operation will make a net profit.

Pruning: the removal of live or dead branches from a standing tree.

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Pruning:
the removal of live or dead branches from a standing tree.

The total area tended rose in 1998/99, mainly due to increased cleaning work to treat backlog areas identified as not FTG on management units where new SFLs were issued. More pre-commercial thinning was also done in young jack pine stands in the Northwest Region and, to a lesser extent, in the Northeast Region. Unevenaged stand improvement work decreased slightly in 1998/99; most of this was done in the Southcentral Region in tolerant hardwoods. As in 1997/98, little protection activity was implemented in 1998/99.

A total of 727 hectares of commercial thinning was also carried out in 1998/99, mainly in the Northwestern Region in immature jack pine stands. This area was not included in Table 9 since commercial thinning is classified as a harvest method.

Funding for Forest Renewal

The financial mechanisms established under the CFSA and outlined in Chapter 4 ensure that there will always be funding available for forest renewal.

Each company with an SFL contributes the appropriate level of renewal charges to an account in the Forest Renewal Trust fund. These funds may only be used to conduct eligible silviculture work on the specific license area from which the funds were generated upon harvest.

Operators with an FRL, who do not operate on an SFL, pay their renewal charges into the Forest Renewal Special Purpose Account. This account provides dedicated funding for forest renewal on management units where harvesting and other operations are conducted on Crown land by companies that do not hold SFLs.

Ministry of Natural Resources is responsible for the administration of the Forest Renewal Special Purpose Account. As with the Forest Renewal Trust fund, each forest or management unit has its own separate account to cover forest renewal costs.

Money for a third fund, the FFT, came in 1998/99 from a portion of the Crown charges that all licensees paid. In addition, any administrative penalties assessed under the CFSA are paid into the FFT.

The FFT, managed by an independent committee established by the Crown, funds projects that meet MNR-approved criteria. To qualify, projects must be: a silvicultural activity on Crown land that addresses renewal of trees killed or damaged by fire; renewal of land where a

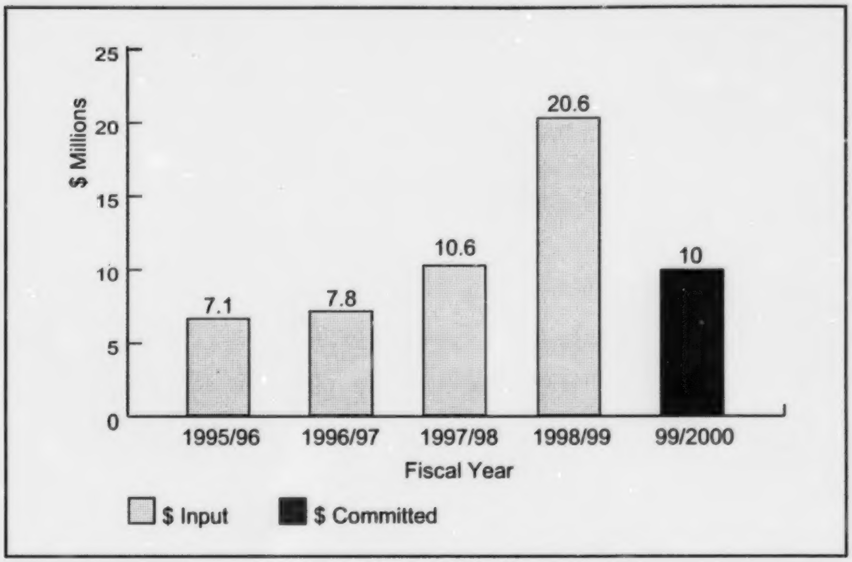


Figure 13
Forestry Futures Fund: Annual Funds Input and Committed as of April 1, 1999

licensee becomes insolvent; forest protection from insect or disease infestation; or intensive stand management related to a critical wood supply.

The annual contributions to the FFT are summarized in Figure 13. The amounts shown through 1998/99 are actual values and the more recent amounts identified are predictions based on commitments for multi-year projects. The amount of funds deposited to the FFT fund in 1998/99 was about $20.6 million (includes $8.4 million in conversion funds).

Transition funding is provided by MNR to the Forest Renewal Trust accounts and Forest Renewal Special Purpose Accounts to provide an adequate level of "start-up" capital and to ensure ongoing viability of the accounts.

In addition to these trust funds and special purpose accounts, money was directed from the provincial treasury to MNR-supported forest renewal through the operation of bareroot nurseries, the Ontario Tree Seed Plant, and tree improvement programs.

Total forest renewal expenditures in 1998/99 were $ 111.5 million, which was approximately a 12 percent increase over the previous fiscal year. Sources of these expenditures were:

• Direct MNR expenditures	$2.8 million
• Forest Renewal Trust fund	$92.6 million
• FFT fund	$9.2 million
• Special Purpose Account	$6.9 million

In 1998/99, some adjustments to renewal rates took place on individual management units to reflect the local costs of renewing various species and to reduce some accumulated surpluses. A number of units lowered the rates for conifers, poplar, and white birch. These rates will continue to be reviewed and adjusted annually to ensure adequate levels of renewal are maintained. A complete listing of the 1998/99 renewal rates for each management unit is provided in Appendix 5.

Chapte 7

Most forest access roads on Crown land are planned, constructed and paid for by the forest industry. The forest management plan for each management unit describes the location, construction, maintenance, and use management of access roads that exist or are planned for construction. These roads are essential for carrying out forest management activities. They also provide public access to provincial Crown land for tourism, outdoor recreation, mining, and other activities.

This report provides information on the construction of primary and secondary forest access roads. It provides information on road maintenance activities, which include grading, snow plowing, realignments, flood repairs, bridge repairs, and any other activity necessary to maintain existing roads. This chapter also reports on controlling access to roads, implementation of abandonment measures, and how this work was funded.

Road Construction and Maintenance

Figure 14 shows total provincial road construction in 1998/99 for primary and secondary forest access roads in each MNR region. Total road construction for 1998/99 amounted to approximately 840 kilometres, which is about a 15 percent decrease from the 1997/98 construction total of 979 kilometres. There were 314 kilometres of primary roads constructed in the province and 526 kilometres of secondary roads.

Figure 15 shows total provincial road maintenance in 1998/99 for each MNR region. Total road maintenance for the year was carried out on approximately 15,952 kilometres of primary and secondary roads, which is about a 9 percent increase over the 1997/98 total of 14,630 kilometres.

In 1998/99 the forest access road program, funded by MNR, reconstructed 76 kilometres of roads and maintained 115 kilometres of forest access roads in northern Ontario at a cost of $1.9 million. Most of the roads funded under MNR's program serve several purposes, including public access and forest management.

ROAD CLASSES

Primary Roads

Essentially permanent roads. They are regularly maintained with a life expectancy in excess of 15 years.

Secondary Roads

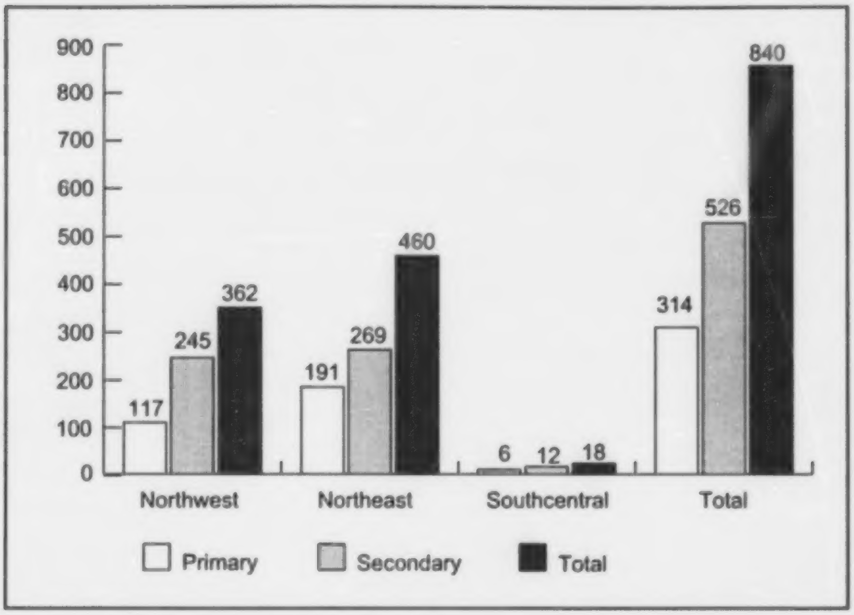
Essentially branches off primary roads. They are not considered permanent and are not normally maintained beyond their 5 to 15-year period of use.

Tertiary Roads

Built for short-term use (i.e., up to five years). They are not normally maintained beyond their period of use.

Figure 14

Road Construction (kilometres) in 1998/99 by Road Class and MNR Region



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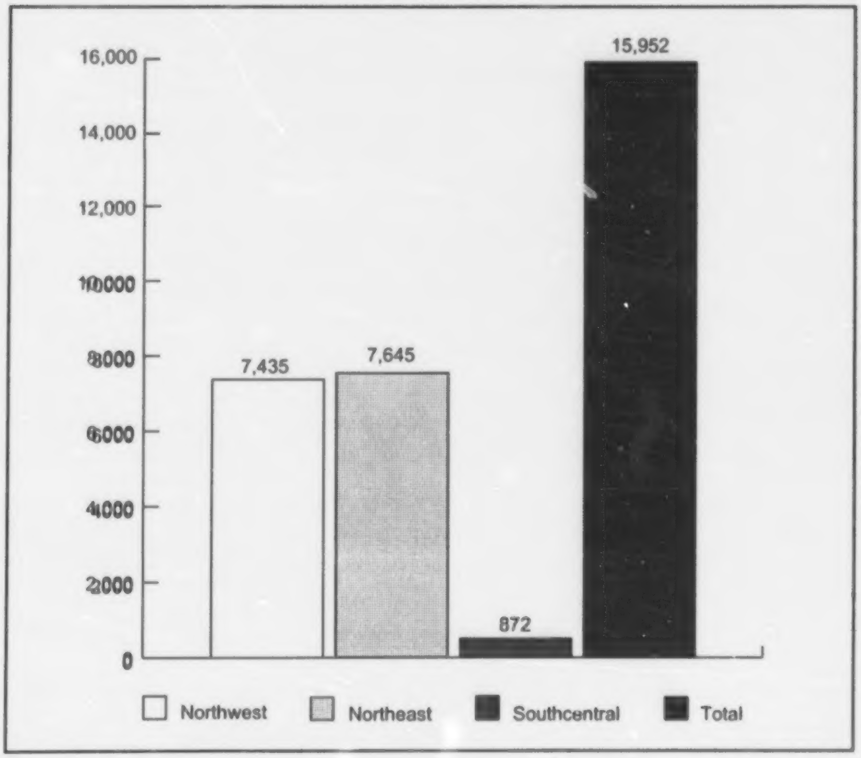
Road Maintenance (kilometres) in 1998/99 by MNR Region



Road Abandonment and Access Control

Road abandonment and access control must be planned in advance of construction and documented in the forest management plan for each management unit. These activities must also be reported in the management unit annual report.

Figure 16 shows the total length of primary and secondary roads that were abandoned in each MNR region in 1998/99. In total, 1,592 kilometres of road were abandoned. This total was made up of 900 kilometres in the Northwest Region, 206 kilometres in Northeast Region, and 486 kilometres in the Southcentral Region. The method of abandonment for the majority of these roads was natural abandonment.

For reasons of public safety and/or resource management, access roads may be closed temporarily,

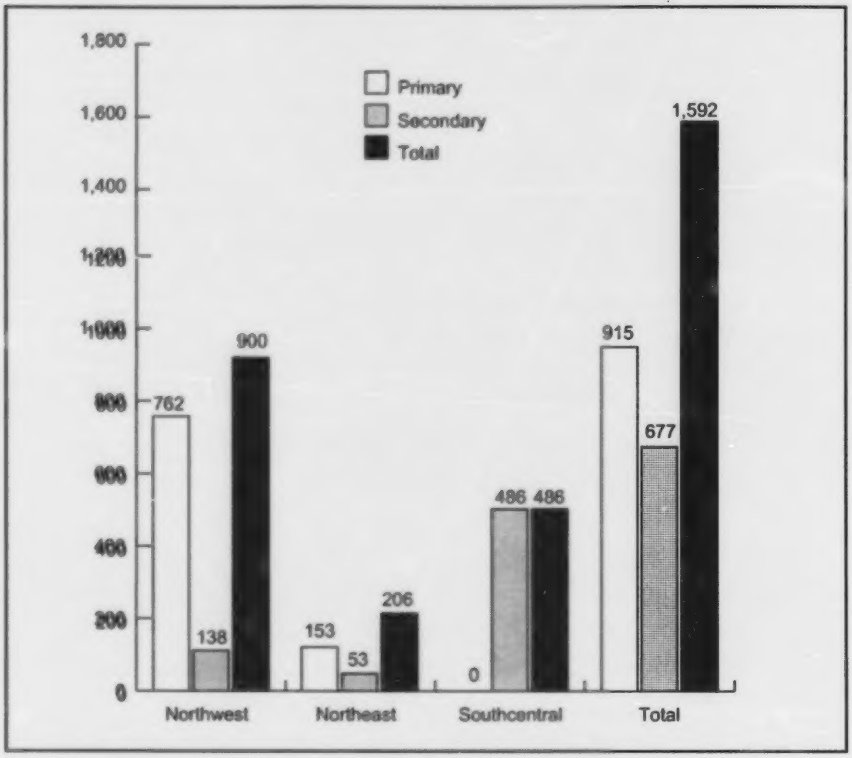


Figure 16

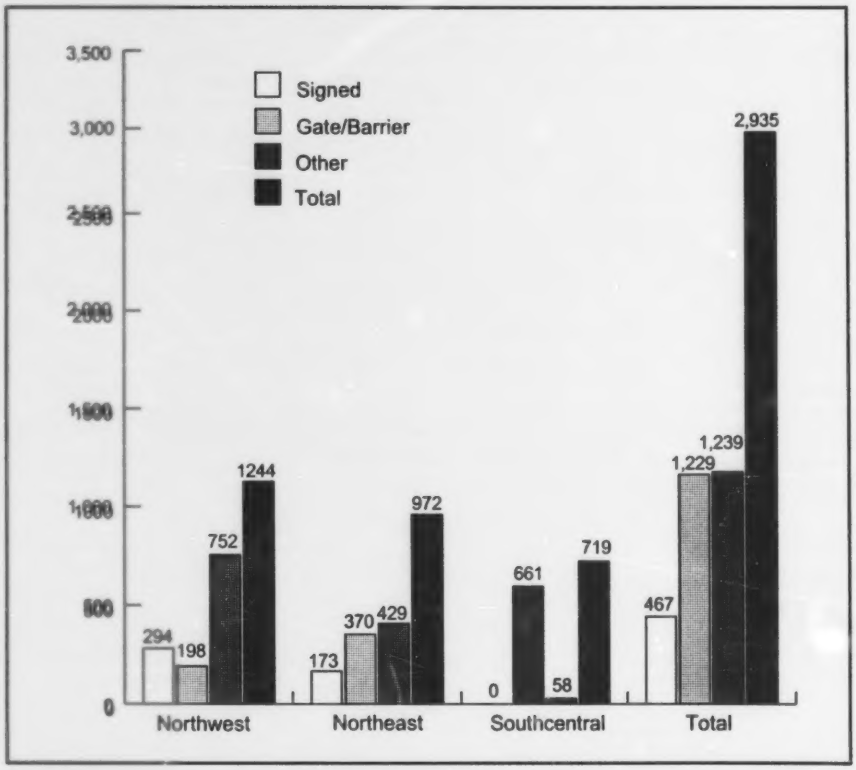
Road Abandonment (kilometres) in 1998/99 by Road Class and MNR Region

Figure 17

Road Access Control (kilometres) in 1998/99 by Control Method and MNR Region

seasonally, or on a permanent basis. Methods used to control access can generally be classified into two categories: erecting signs to advise the public of the restriction (referred to as "signage"); or erecting gates or using other physical means such as ditching (referred to as "gated" or "physical barrier").

Figure 17 shows the length of primary and secondary roads that had controlled access during 1998/99 in each MNR region. A total of about 2,935 kilometres of road had access controls, consisting of 1,244 kilometres in the Northwest Region, 972 kilometres in the Northeast Region and 719 kilometres in the



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Access Control:
The closure of a road to public travel or the restricted access to a road for certain specified uses for given periods of time.

Road Abandonment:
The use management strategy adopted when a road has fulfilled its original use and is no longer required, or when maintenance cannot be justified.

Natural Abandonment:
The natural degradation of a road when it is not maintained. Road maintenance has ceased and steps are not taken to prevent the use of the road by vehicular traffic through means of physical disablement.

Physical Abandonment:
A deliberate act to render a road unusable by vehicular traffic. For example: gating, ditching, bridge or culvert removal, etc.

Southcentral Region. Provincially, access was restricted on 1,229 kilometres of road by gating and on 467 kilometres of road by signage. Another 1,239 kilometres of road had access control through unspecified means and are shown as the "other" category in Figure 17.

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Chapter 8

Monitoring and Compliance

Forest operations in Ontario are monitored and audited to assess compliance and evaluate progress and results. There are three types of monitoring: effectiveness, effects, and compliance. The information collected and analyzed for effectiveness monitoring determines how well the forest is growing. Effects monitoring assesses the impacts of operations on various aspects of the forest ecosystem through long term studies. Compliance monitoring is conducted to ensure that MNR and the forest industry carry out operations according to plans, regulations, and the required standards. Operations are also audited through Independent Forest Audits, providing independent published audits of management units across the province.

Forest Auditing

Independent Forest Audits are a requirement of the CFSA, Term and Condition #86 (T & C #86) of the Timber Class EA decision and are a condition of SFLs. All management units, both Crown and SFL, are audited at least once every five years to review actual operations and examine the forest management activities carried out over the previous five years.

The audit is a systematic and documented verification process to assess adherence to the forest management plan and the planning process. Assessing the interpretation and application of provincial policies, manuals, and guidelines at the management unit level is also part of the audit. Auditors examine the effectiveness in achieving the planned objectives and provide an assessment of forest sustainability for the management unit. Audit teams review licensee compliance with the obligations of their specific SFL..

In order to address the audit purpose and objectives, the audit process and protocol document sets out the forest management principles, criteria, and procedures for undertaking Independent Forest Audits. The audit protocol identifies eight guiding principles, identified by the following titles:

commitment, public participation, forest management planning, plan implementation, systems support, monitoring, achievement of management objectives and forest sustainability, and contractual compliance. For each principle, a series of specific criteria are identified that, when met, will result in achievement of the principle.

The audit terms of reference are the same for all Independent Forest Audits, including the audit team personnel requirements. Each audit team consists of a lead auditor who is trained in auditing procedures and has current auditing experience, a minimum of two foresters with experience in forest management planning and forest operations, and an individual trained in forest ecology or wildlife management. All members of an audit team must have a minimum of seven years recent and relevant experience in similar forest types, must be independent of the operations they audit, as well as be free from conflict of interest throughout the process. The audit team must include a Registered Professional Forester. For the 1998 audits, the audit team was required to provide an audit against the requirements that were in effect during the audit period and prepare the subsequent report for publication.

Action plans must be developed for each audit report. The licensee and the MNR district responsible for the management unit jointly develop the action plan. For each recommendation in the audit report, the action plan must state the required action, the organization and individual responsible for the work, deadline dates, and a method of tracking the progress of the action plan. A status report for the action plan is also required two years after acceptance of the audit report to ensure that progress is occurring as specified in the action plan. The Independent Forest Audit reports are published and are available upon request.

In 1998, Independent Forest Audits were conducted on three SFLs, namely the Driftwood, Timmins, and White River Forests. There were also three audits of units managed by the Crown, specifically the Kenora, Timmins and Pembroke (now the Ottawa Valley Forest SFL) Management Units. For the Crown management units, it should be noted that the audit examined a period greater than five years because these management units had not been subject to a previous external review or audit. The auditors have indicated that each forest or management unit was managed in overall compliance with the audit protocol criteria, except for those matters that they have identified in their audit reports as needing improvement. In all three of the SFL audits, the auditors recommended, or were in support of, licence renewal. On Crown management units the auditor is not expected to make a recommendation related to licence renewal.

Driftwood Forest

The Driftwood Forest is managed by Donohue Forest Products Inc. The audit report indicated that the unit is very well managed and was managed in compliance, in all material respects, with the audit protocol criteria during the five-year period ending March 31, 1998. The audit report identified ten recommendations. The report indicated that the company has adapted its management practices to the nature of the area and carries out operations with minimal environmental effects, while achieving excellent forest regeneration. However, the auditor identified a number of items requiring improvement with regard to the management of the SFL: company personnel should improve communication with local First Nations; markets should be found for the balsam poplar and birch; and MNR must provide sufficient resources for compliance monitoring and ensure that the necessary reports and records, including those for compliance, are available. An issue identified in Appendix A of the audit report, which is completed by the forest manager, is the need to incorporate areas which are FTG into the forest database. The company is currently working on this issue. These areas (30 percent of the production forest) are currently listed in tables as not satisfactorily regenerated (NSR). According to the company, most of these areas meet FTG standards but have not yet been reviewed by the MNR for inclusion in the FTG landbase. Licence renewal was recommended.

Timmins Forest

The Timmins Forest is managed by Donohue Forest Products Inc. The audit report indicated that this forest is managed to a high standard and was in compliance with all legislative and contractual requirements during the five-year period ending March 31, 1998. This audit report identified five recommendations. In addition, the auditor identified several items requiring improvement with regard to the management of the SFL: the company must compile and report FTG information on areas harvested and renewed; there is a need to implement a program of road maintenance, signage, monitoring, bridge improvement, and/or physical abandonment that ensures that unsafe and unsound water crossings are repaired or improved; and company staff should spend more time monitoring operations. As noted for the Driftwood Forest, there is also a need on the Timmins Forest to incorporate areas that are FTG into the forest database. Sixteen percent of the production forest is listed in tables as

NSR, but apparently most of these lands meet FTG standards but have not yet been reviewed by the MNR for inclusion in the FTG landbase. Licence renewal was recommended.

White River Forest

The White River Forest is managed by Domtar Inc. The audit report indicated that the forest is well managed, and that management practices conformed to the requirements of management documents and legislation in place during the five-year period ending March 31, 1998, with the exceptions noted in the audit report. The audit team noted that it was impressed both by the professional excellence of the White River Forest staff and the aggressive manner in which they approach forest management. This audit report identified 13 recommendations. In addition, the auditor identified a number of items requiring improvement with regard to the management of the SFL; the Maximum Allowable Depletion must be fully allocated in the forest management plan and any surpluses must be declared; all of the parties involved with wood supply commitments need to ensure fair distribution of poplar to designated mills; the company and MNR should develop systems to improve awareness, inspection, and communication relating to compliance matters; and the company should improve its ability to regenerate spruce on competitive upland sites. Licence renewal was recommended.

Kenora Management Unit

The audit report for the Kenora Management Unit indicated that forest management staff were doing an excellent job and, with the exceptions noted in the report, forest management activities conformed with existing policies and legislation in force for the seven-year period ending March 31, 1998. This audit report identified ten recommendations. The auditor also identified a number of items requiring improvement with regard to the management of the unit: finding markets for the hardwood fibre continues to be difficult; and MNR needs to secure adequate human resources to carry out the forest management responsibilities on the unit, in light of the uncertain tenure of the unit. Obtaining input from the 12 First Nation communities situated within the unit continues to be challenging, as does successful implementation of the related T & C #77 of the Timber Class EA decision. The auditor recommended that MNR provide policy direction to the district to facilitate the implementation of T & C #77. The existence of significant obstacles in obtaining wood supply from a significant portion of this unit stresses the need for a prompt decision on the land use status of the Aulneau Peninsula. A proponent is being sought to establish an SFL on this unit.

Pembroke Management Unit

The audit report of the Pembroke Management Unit indicated that forest management was undertaken in general compliance with the rules and regulations governing forest management during the eight-year period ending March 31, 1998. The report identified six recommendations. As well, the auditor identified a number of items requiring improvement with regard to the management of the unit: FTG surveys for areas harvested, but not yet surveyed, must be undertaken immediately; MNR should expand the definition of tertiary roads to include permanent tertiary roads because in southern Ontario these roads continue to be used over the long term by many forest users; MNR and the SFL holder need to develop a Memorandum of Understanding identifying responsibility for maintenance and repair of continuously passable roads; information systems should be upgraded; and utilization should be increased from the current average of 60 percent of the planned area actually being harvested. The Ottawa Valley Forest SFL has been issued for this unit.

Timmins Management Unit

The audit report for this management unit indicated that management practices, with the exceptions noted in the audit report, conformed with the requirements of management documents and legislation in place during the seven-year period ending March 31, 1998. This audit report identified 16 recommendations. As well, the auditor identified a number of items requiring improvement with regard to the management of the unit: the accuracy of the FRI data needs to be addressed, both to clarify the uncertainty about the accuracy of the total area and to incorporate large areas (15 percent of production forest) left as NSR into appropriate FRI stand classes; MNR should take early action on conversion to an SFL or ensure that the district has adequate resources to deliver its mandate; information and record-keeping requires improvement, including the development of a records management system that links treatments to specific ground locations; and preliminary tables in the current forest management plan need to be updated as soon as possible. Many of these concerns are reflected in the recommendation that immediate action be taken to begin correcting deficiencies related to the MNR district's ability to determine forest sustainability. Discussions related to a potential SFL for this management unit are ongoing.

The following Independent Forest Audits of SFLs are planned for 1999: J.E. Martel, Timiskaming (includes the former Timiskaming, Watabeag and Elk Lake Management Units), Big Pic, Lakehead, Dryden, Fort Frances Forest, Flanders Forest, Trout Lake, Whiskey Jack and Caribou Forests. In addition, there will be two audits of Crown management units, Lanark and Mazinaw Management Units. The results of these audits will be published upon completion.

Compliance Monitoring

The forest operations compliance monitoring system in Ontario is designed to ensure that both the MNR and forest industry carry out operations according to approved plans and operational standards, and in compliance with legislation. At the management unit level, inspection reports are prepared for harvest, access, renewal, maintenance, and protection operations. These reports assist managers to focus on any activities that may require immediate attention, provide a database for identifying provincial trends, and provide feedback for compliance program adjustment.

Prior to fiscal year 1998/99, MNR was solely responsible for forest operations compliance throughout Ontario. Effective April 1, 1998, all existing SFL holders assumed lead responsibility for conducting a comprehensive program of forest operations compliance as a condition of their licence. The program includes planning, monitoring, inspection, reporting, training, and education. At that time, the MNR role changed from full inspection to one of monitoring/auditing and conducting "spot-checks" of industry compliance inspection activity. On the few management units where MNR still conducts forest operations, the MNR remains directly responsible for delivering the compliance program.

The 1998/99 annual report is the first to provide the results of "industry compliance self-monitoring and reporting" across the province. In addition, it is the first provincial annual report that derives its information largely from a standard electronic format for inspection reporting. Effective April 1, 1998, it became mandatory for all MNR staff to use the Forest Operations Compliance Information System (FOCIS) to complete inspections of Crown units and SFLs, and to submit them to the provincial database, the Compliance Information System (CIS). Additionally, this annual report also captures those electronic inspection reports submitted to the MNR by SFL holders who are using FOCIS. The use of electronic reporting is currently voluntary for industry.

Table 10

Forest Operations Compliance Inspection Reports Summary 1998/99

	INDUSTRY			MNR					
Operation Type	Total # Reports	Total # Compliant Reports	Total # Non Compliant Reports	Total Audits, Checks, Verifications	Total # Compliant Reports	Total # Non Compliant Reports	Significance of Non Compliant Reports Minimum	Moderate	Significant
Access	678	656	22	437	346	91	65	19	7
Harvest	1,721	1,610	111	1,572	1,194	378	265	83	30
Renewal	385	383	2	136	124	12	10	2	0
Maintenance	144	144	0	38	34	4	4	0	0
Protection	4	4	0	1	1	0	0	0	0
TOTAL REPORTS	2,932	2,797	135	2,184	1,699	485	344	104	37

Notes: The data for each operation type should not be examined in isolation due to the interrelated nature of activities. An inspection is comprehensive in terms of its ability to examine all related activities or sub-activites within the operation.

Interpreting the data collected through FOCIS and CIS this first year requires experience and understanding of the systems and the 'new' roles and responsibilities under the MNR and forest industry partnership. It is expected that several years of electronic data collection will be required before statistically confident and consistent information can be reported. The reports for 64 management units are included in the 1998/99 annual report.

The forest industry (SFL holders) is required to report all incidents of non-compliance on their management unit to the MNR. This includes infractions incurred by the SFL, overlapping licensees and any private individual who contravenes the CFSA. However, the SFL does not have responsibility for assessing the degree of significance of a non-compliance. This is strictly an MNR responsibility.

Ministry of Natural Resources is the regulatory agency with respect to forest operations compliance; MNR "verifies" all instances of non-compliance as reported by companies. Therefore, for each report of non-compliance by industry there will also be at least one MNR inspection report. For those incidents that are moderate or significant, MNR will actively monitor the non-compliance until it is resolved. This action may result in additional reports of non-compliance by MNR. Also, MNR undertakes random as well as planned "spot-checks and audits" of forest operations. This may result in additional reports of non-compliance that may not have been reported by a company due to differences in interpretation between the industry inspector and the MNR inspector.

Furthermore, in some cases, especially those of a minor nature, industry may remedy the situation and deem the infraction too minor to report. In summary, fundamental differences between the MNR audit and verification role and that of the industry inspection role will lead to differences in the non-compliance reported by MNR and industry, with the MNR total non-compliant reports generally tending to be greater. Results of both industry and MNR compliance inspections are summarized in Table 10.

Joint Inspections/Exchange: Of the total 5,116 inspection reports undertaken across the province, 1,008 were conducted jointly between MNR and company staff. This activity is encouraged in the first year or two where new SFL s have been created to establish consistency in observations and reporting or where interpretation issues require resolution. It is a requirement that all "in-compliance" inspection reports be exchanged within five working days (1998/99) of completion of the inspection report. In cases of non-compliance, industry must report these situations within five working days or within 24 hours of the discovery of the violation, if the violation is potentially significant.

Road Washouts: Appendix 20 of the Timber Class EA decision requires MNR to report annually on road washouts. Compliance inspections of road water crossings conducted throughout 1998/99 indicate that 17 washouts were reported by forest companies and 23 were identified by the MNR, for a combined total of 40. Washouts can occur due to a number of factors, including natural causes such as flooding and blockage due to beaver activity, and poor road construction techniques.

Actions Taken: In the new compliance partnership model, industry must report non-compliance situations and MNR verifies, assesses the significance, and determines the appropriate remedy and enforcement action if any is required.

In many instances of minor non-compliance, immediate remedial action is undertaken and enforcement measures are not warranted. While the CFSA remedy and enforcement provisions apply largely to licensees of the Crown, any person who contravenes the CFSA may be charged. Thirty-six private individuals who were not authorized to conduct forest operations were charged under the CFSA; these are identified as an offence charges in Table 11.

A breakdown of remedy and enforcement action taken in 1998/99 is provided in Table 11.

Table 11

Remedy and Enforcement Action Taken (1998/99)

Method	Count	Fine
Administrative Penalty	49	$171,917.72 (to FFT)
Offence Charge	36	$ 34,748.25 (to general revenue)
Stop Work Order	2	n/a
Repair Order	7	n/a
Compliance Order	16	n/a
Warnings	21	n/a
Investigations (no charges warranted)	4	n/a
TOTAL	135	$206,665.97

Although all incidents of non-compliance are reported in the fiscal year in which they occurred, a number of cases are ongoing (under investigation) in terms of remedy and enforcement action, and they will be recorded when resolved.

Effectiveness Monitoring

Harvest and renewal activities are reported annually at the time they are implemented. The success of these activities in regenerating the forest is determined by specific assessment methods, which are conducted over a number of years (usually from 5 to 15 years) after regeneration treatments are completed. Free-to-grow assessments are an effectiveness monitoring tool that provides an indication of the success of the silviculture treatments and provides information to project the future forest condition. These assessments involve a variety of techniques including field measurement of trees on sample areas of the forest, aerial surveys and remote sensing. Some forest managers conduct these surveys annually, while others prefer to accumulate larger blocks that they assess once every few years. This has resulted in a backlog of areas needing assessment. The Forest Renewal Trust fund now provides funding for these surveys on SFL areas and many forest companies are now assessing their regularly scheduled regeneration areas as well as the backlog areas.

Figure 18 summarizes the areas assessed and those that were declared FTG for 1998/99 by region for the 47 management units that reported. Of the total area assessed for FTG, 89 percent was approved as having achieved the FTG standard within a set time period. This varies from 92 percent in Northwest Region to 88 percent in the Northeast Region and 65 percent in the Southcentral Region.

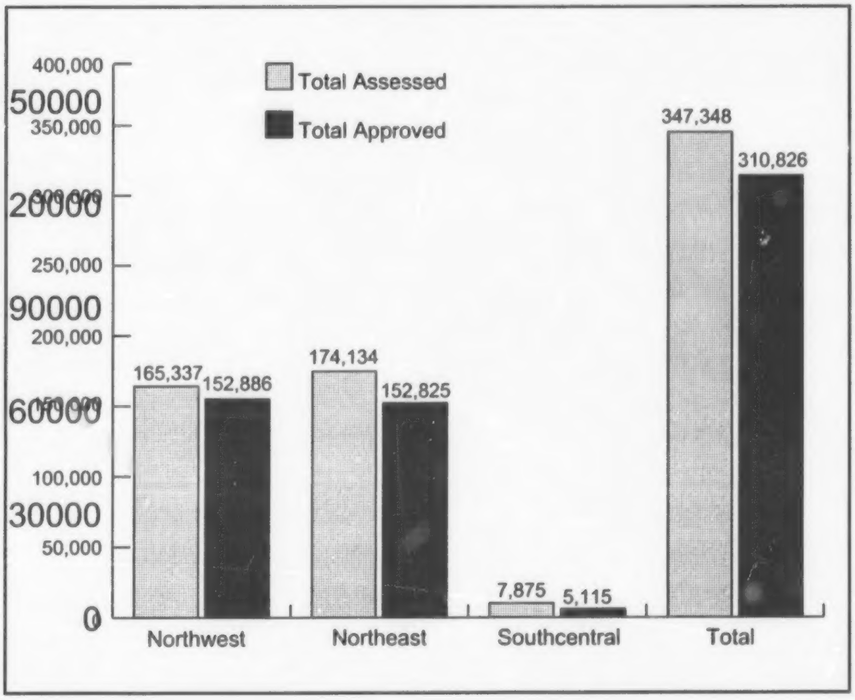
Some of the areas found not to be classified as FTG at this time will require re-treatment and others will require tending (i.e., to suppress undesirable competing vegetation such as brush and grass). Other areas will simply require the passage of more time to allow for the incremental growth necessary to meet the height standard for FTG. All harvested areas are required to be renewed successfully.

Effects Monitoring

Effects monitoring is a long term assessment of potential forest management impacts on the forest ecosystem. The summary of research activities and scientific studies for 1998/99 pertaining to forest operations and practices is presented in Chapter 10. As part of MNR's adaptive management practices, the results are used to update existing guidelines and policies and to prepare new ones.

Figure 18

Summary of Area (hectares) Declared Free-To-Grow by MNR Region (1998/99)



Chapter 9

Implementing [illegible] Condition

Term and Condition #77 of the Timber Class EA decision requires the MNR to negotiate with Aboriginal peoples at the local level regarding opportunities for more equal participation in the benefits of forest management. In referring to Aboriginal peoples, T & C #77 includes communities, individuals, enterprises, and organizations.

The wording of T & C #77 is as follows:

> During the term of this approval, MNR district managers shall conduct negotiations at the local level with Aboriginal peoples whose communities are situated in a management unit, in order to identify and implement ways of achieving a more equal participation by Aboriginal peoples in the benefits provided through timber management planning. These negotiations will include but are not limited to the following matters:
>
> a) Providing job opportunities and income associated with bush and mill operations in the vicinity of Aboriginal communities.
>
> b) Supplying wood to wood processing facilities such as sawmills in Aboriginal communities.
>
> c) Facilitation of Aboriginal third party licence negotiations with existing licensees where opportunities exist.
>
> d) Providing timber licences to Aboriginal people where unalienated Crown timber exists close to reserves.
>
> e) Development of programs to provide jobs, training and income for Aboriginal people in timber management operations through joint projects with the Department of Indian and Northern Affairs.
>
> f) Other forest resources that may be affected by timber management or which can be addressed in the timber management planning process as provided for in Condition 23(c).

Implementation

The scope of T & C #77 is broad, and its application and implementation are determined by variables at the local level. The arrangements and agreements that are effected by MNR district managers and Aboriginal communities take different forms, in an effort to accommodate to the extent possible the unique needs, capacities, and situations of individual Aboriginal communities in the context of available opportunities.

The implementation of T & C #77 may include the involvement of individual Aboriginal communities, or groups of communities, with common interests that are situated in a common geographic area. Linkages with Tribal Councils and regional organization representatives are taken into consideration and encouraged.

In its decision, the EA Board ordered MNR to build upon initiatives it was already pursuing and to provide new opportunities for Aboriginal peoples that will enable them to benefit from forest management activities in their local areas.

In January 1996, MNR released a draft version of the "Implementation Guidelines for Term and Condition #77 of the Class Environmental Assessment." The purpose of these guidelines is:

- to provide MNR district managers with a consistent framework for the implementation of T & C #77 that builds upon existing initiatives and facilitates the development of new initiatives
- to provide Aboriginal communities and forest industry companies with the information MNR district managers will use in the implementation of T & C #77

MNR implements T & C #77 consistent with the CFSA, which provides legislative authority to MNR for the sustainable management and use of forest resources. The CFSA has enabled MNR to put mechanisms in place that may assist in facilitating the implementation of T&C #77.

While responsibility for implementation of T & C #77 rests with MNR, the EA Board recognized that the involvement of other parties would be critical to successful implementation. Such involvement would include the participation of First Nations and other Aboriginal communities, the forest industry, and other government bodies (e.g., Ontario ministries, Department of Indian and Northern Affairs Canada, Natural Resources Canada).

Aboriginal participation in forest management and economic development activities is summarized under four categories: access to resources, role in planning and management, silvicultural opportunities, and training and development.

Access to Resources

First Nations are often in a position to operate as forest harvesters. Although Ontario's wood supply is almost completely allocated to SFL holders, MNR has helped the industry and the Aboriginal communities negotiate types of access. For example, overlapping licences have been issued to First Nations.

In other examples, First Nations have "first opportunity" to buy in as an independent operator when opportunities arise. The industry has been innovative and willing to consider a variety of means for First Nations to increase their access to forest resources.

Role in Planning and Management

Ontario has increased the role for First Nations through the CFSA. Districts have responded by seeking effective forums for Aboriginal communities to have a greater say in the planning and management of forest resources nearby. It is mandatory for forest management plans to include a detailed Native Background Information Report and Native Values maps. Districts have provided financial assistance to some communities to either prepare these components themselves, or to hire archeological research contractors.

In some districts, First Nations are represented directly with industry and government on the forest management planning team responsible for the planning decisions for each five-year plan.

Silvicultural Opportunities

Forest renewal offers a long list of operational requirements: growing trees, planting , tending, thinning, spraying, site preparation, and more. Many First Nations have experience in at least some silvicultural activities, and district managers have sought specific agreements between industry and First Nations to detail the type and scope of contract work that can be made available on a competitive basis. This work, taken together, can contribute to an effective economic development program.

Training and Employment

Although MNR is not the ministry with a training mandate, district managers have found ways to help coordinate existing federal and provincial programs to assist Aboriginal communities to prepare for increased participation in forest management activities.

On a more local level, districts have provided hands-on training for many years, through the Native Internship Program and Sault College's Aboriginal Resource Technician Program. The Aviation, Flood and Fire Management Branch of MNR has trained firefighters on several reserves, and prepared them for bidding on contracts.

In some districts, the forest industry provides the training strategy, recruitment and hiring support, and business opportunities for independent contractors. In some instances, MNR is taking the lead to assist in providing the building, equipment and leadership to establish a training centre for Aboriginal peoples.

In all districts, there have been joint projects with First Nations for many years, with MNR providing the training, funding, facilities, and equipment.

District Progress

Ministry of Natural Resources is required to report on the progress of negotiations under T & C #77 for each district. Of the 26 MNR districts, five are outside the AOU, including Aylmer, Aurora, Cambridge, Midhurst, and Peterborough. A more detailed description of benefits provided to Aboriginal communities in each MNR district follows.

Algonquin Park

Management Unit: Algonquin Park Forest

There are no First Nations or other Aboriginal communities situated within the Algonquin Park Forest. Algonquin Park is part of the traditional territory of several Algonquin communities surrounding the provincial park, including Pikwakanagan (formerly Golden Lake), Mattawa, Bancroft, Whitney, Sharbot Lake and Ottawa. Portions of the park are also included in the Robinson-Huron Treaty and Williams Treaty areas.

Ontario and the federal government are engaged in land claim negotiations with the Algonquins of Ontario. Discussions continue with the Algonquins on forest-related economic opportunities as part of the ongoing land claim negotiations.

Several Algonquin community members are employed in sawmill and woodland operations that harvest timber from Algonquin Park. The Algonquin Forestry Authority has been and continues to enter into contractual arrangements for road maintenance and silvicultural work with individual Algonquins and with community economic development corporations. Opportunities have been identified to supply tree seedlings from the Corry Lake Tree Nursery, an enterprise of Makwa Economic Development Corporation.

Bancroft District

Management units: Bancroft, Minden, Mazinaw

There are no First Nation communities in the Bancroft District. However the Algonquin First Nation has satellite communities around the Bancroft, Sharbot Lake, and Whitney areas.

The district initiated discussions with the Algonquins of Whitney, Baptiste Lake Algonquins, and the Golden Lake and Curve Lake First Nations to identify opportunities to become involved in forest management opportunities. Two FRL licenses provided job opportunities. As well, an estimated 15 tree-marking contracts were awarded to companies who are affiliated with First Nation communities or have Aboriginal personnel in their work force. A contract was awarded to Makwa Economic Development Corporation, an Aboriginal-affiliated company, to produce tree seedlings for the Bancroft-Minden SFL in the future. Fuelwood harvesting areas were designated to Curve Lake First Nation through the Bancroft-Minden SFL document.

The Algonquins of Whitney is a member of the independent licensees in Bancroft-Minden and hold a supply agreement to harvest 100 hectares per year that provides an estimated five full time job opportunities. Two forestry companies harvesting timber under FRLs employed two Aboriginal people.

There are currently two First Nation representatives on the Local Citizens Committee (LCC); one each on the Bancroft-Minden and Mazinaw-Lanark Management Units. The Algonquins of Golden Lake submitted a proposal for a training initiative that was supported by a local forest company.

Chapleau District

Management units: Superior Forest, Pineland Forest, J. E. Martel Forest, Upper Spanish Forest

The five First Nations in the Chapleau District are the Brunswick House First Nation, Chapleau Cree First Nation, Chapleau Ojibway First Nation, Michipicoten First Nation, and Missinabie Cree First Nation.

Chapleau District MNR hired a Native Resource Technician, who is a First Nation member, to directly liaise with the First Nations, forest industry, and MNR.

Brunswick House First Nation has been involved in partnership discussions regarding harvesting on Crown Land with a local SFL holder and MNR. Preliminary negotiations are taking place between the SFL holder and the First Nation to identify the First Nation's annual capacity to harvest mixedwoods. The First Nation was also advised of forest maintenance, renewal, and silvicultural contract opportunities, e.g., site preparation, roadside slash pile burning, and road construction. Other businesses in the First Nation elected not to pursue available contract opportunities. A trucking company operated by a First Nation member had contracts with a local forest company's main log haul contractor.

Chapleau Cree First Nation was advised of forest maintenance, renewal, and silvicultural contract opportunities, e.g., site preparation, roadside slash pile burning, and road construction. The community requested and received a tender package on slash pile burning for their consideration. A general contracting company operated by First Nation members was under contract to supply gravel for road construction/maintenance, excavation work at the mill site, and winter sanding services to a local forest company.

Chapleau Ojibway First Nation was advised of forest maintenance, renewal, and silvicultural contract opportunities, e.g., site preparation, roadside slash pile burning, and road construction. A local forest company employs two First Nation members on a full time basis in road construction and maintenance. It is estimated that seven community members are employed in the local sawmill and planer operations.

Michipicoten First Nation has members who live in the Chapleau District but do not occupy either of their two unoccupied land bases situated within the Superior Forest Management Unit. The Chief and Council for the community is located at the Gros Cap location, east of Wawa, and to date have not pursued forest management opportunities in the Superior Forest.

Missinabie Cree are involved in ongoing negotiations for a reserve on the Superior Forest Management Unit. The SFL holder in the area has recognized the community's historical interest in the area and has agreed to discuss access to future economic development opportunities.

Cochrane District

Management units: Cochrane, Driftwood Forest, Iroquois Falls Forest, Moose River, Smooth Rock Falls Forest

The seven First Nations in the Cochrane District are Attawapiskat, Fort Albany, Fort Severn, Kashechewan, Moose Cree, New Post, and Weenusk. Only one, New Post, falls within the AOU. Moose Cree's traditional territory stretches south into the AOU. As well, Wahgoshig First Nation's traditional territories stretch north from Kirkland Lake District into Cochrane District and this First Nation is active in forest management discussions in the district.

Moose Cree First Nation successfully harvested 45,000 cubic metres of wood off the Moose River Management Unit.

New Post First Nation was offered harvesting opportunities but continued to negotiate for higher allocations and have yet to agree on a final allocation. The New Post First Nation, under other contractual arrangements, harvested 23,957 cubic metres of wood. Employment opportunities in the local mill were discussed. An MNR employee was dedicated to work with the community to complete Native Values mapping for the district. The Town of Cochrane and the Township of Glackmeyer formed a partnership with the First Nation to carry out feasibility studies for a finger joint processing plant. A local forest company sponsored a community member to attend the Native Resource Technician program at Sault College.

Wahgoshig First Nation has overlapping traditional territory in the Cochrane District and is involved in discussions on access to silvicultural and harvesting opportunities. Pre- commercial thinning contract opportunities and harvesting opportunities have been presented to the First Nation. Financial support provided by the MNR assisted the community to complete a Native Background Information Report for the Iroquois Falls Forest. Offers were made to the community to participate in training opportunities.

Dryden District

Management units: Dryden Forest, Wabigoon Forest, English River Forest

The two First Nations located in Dryden District are Eagle Lake First Nation and Wabigoon Ojibway Nation.

Eagle Lake First Nation has opted not to join the Dryden SFL but continue to have harvest rights on the Dryden forest. The Eagle Lake First Nation harvested 8,358 cubic metres of wood in 1998/99 on the Wabigoon Forest, which provided seasonal employment for 10 to12 Aboriginal people for eight months.

Noopimiing Anokeewin Inc., a company affiliated with Wabigoon Lake Ojibway Nation, has opted not to join the SFL for the Dryden Forest and, as a consequence, while retaining their guaranteed harvest level, no longer receives the silviculture opportunities provided to shareholders of the SFL Company. Included under the SFL agreement, an additional five percent of the planned harvest has been set aside for a concurrent Aboriginal harvest opportunity through a request for proposal. Noopimiing Anokeewin Inc. harvested 50,739 cubic metres of wood on the Wabigoon Forest in 1998/99 that provided full-time employment to an estimated 20 Aboriginal people. In addition, Noopimiing Anokeewin Inc. harvested 3,963 cubic metres on the Dryden Forest. A pre-commercial thinning contract was issued to this First Nation to thin 500 hectares, which provided employment for eight Aboriginal people for five months.

Fort Frances District

Management units: Sapawe Forest, Highrock Forest, Fort Frances Forest, Flanders Forest

The eight First Nations located in the Fort Frances District are Big Grassy, Couchiching, Lac La Croix, Naicatchewenin, Nicickousemenecaning, Rainy River, Seine River, and Stanjikoming First Nations.

The independent Aboriginal contractors and First Nations were allocated 186,452 cubic metres of wood for harvest in 1998/99. In addition, First Nations and independent Aboriginal contractors were given a $100,000 contract for thinning, a substantial tree planting contract, a 76 hectare mechanical site preparation contract and a 121 hectare spacing contract. A road maintenance contract with an estimated value of $250,000 was issued to an Aboriginal business.

It is estimated that over 60 Aboriginal people work in mill and bush operations in the district.

Hearst District

Management units: Gordon Cosens Forest, Hearst Forest, Kapuskasing

Constance Lake is the only First Nation in the district. This First Nation, through an affiliate (Mammamatawa Inc.), was allocated 5,000 cubic metres of wood, in addition to harvesting on other licence areas. They are negotiating a settlement for a wood supply exchange of 75,000 cubic metres of wood.

Kemptville District

Management units: Lanark

The Mohawk Council of Ahkwesahsne and the Algonquins of Ottawa and Sharbot Lake hold regular discussions on forest management opportunities. A member representing the Algonquin communities participates on the LCC. The Algonquin communities are preparing a Native Background Information Report and Native Values map as part of the forest management planning process.

Kenora District

Management units: Kenora, Whiskey Jack Forest

The 12 First Nation communities located in the Kenora District are Big Island, Dalles, Grassy Narrows, Northwest Angle #33, Northwest Angle #37, Ojibways of Onegaming, Shoal Lake #39 (Iskutewisakaygun), Shoal Lake #40, Wabaseemoong, Wabauskang, Washagamis Bay, and Whitefish Bay First Nations. Big Grassy First Nation is located in Fort Frances District but has an interest in resource planning in the Kenora District.

Grassy Narrows First Nation, through an affiliate (K&Q Logging), has a wood allocation of 11,500 cubic metres, which employs between five and eight seasonal workers. Funding arrangements and contracts totaling $22,000 were issued to this First Nation for various projects, including nuisance beaver removal, road maintenance, and youth lifestyle training.

Shoal Lake #39 First Nation holds a license for a wood allocation of 2,407 cubic metres. It is estimated that a half a person year of employment was created.

Shoal Lake #40 First Nation holds a license for a wood allocation of 2,407 cubic metres.

Wabaseemoong First Nation has a license for a wood allocation of 7,221 cubic metres. It is estimated that three full time jobs were created.

Aga-ma-ki-mi-sa-bai Tree Nursery supplied 97,560 container stock for planting on the Kenora Management Unit. A private contractor provided 84 person days of employment to First Nation members on a pre-commercial thinning contract.

Wabauskang First Nation, through affiliates (Mikinaak Logging and Petiquan Logging), had a wood allocation of 2,300 cubic metres of wood. It is estimated that three community members were employed in the forest sector.

Whitefish Bay First Nation had a contract to plant 21,600 seedlings.

Kirkland Lake District

Management units: Elk Lake, Iroquois Falls South, Timiskaming, Watabeag

The three First Nation communities located in the Kirkland Lake District are Beaverhouse, Matachewan, and Wahgoshig.

Matachewan First Nation received $104,900 in contracts to complete silvicultural work. The MNR, local forest companies and this First Nation continue to discuss economic development opportunities and increased access to forest management opportunities. The First Nation expressed an interest in obtaining timber allocations for harvesting. A contract for information collection, values identification and mapping were completed by a member of the First Nation.

Wahgoshig First Nation had a $67,900 contract to complete silvicultural work. At least one member of the Wahgoshig First Nation works for the forest industry in the district. The MNR, local forest companies and this First Nation continue to discuss economic development opportunities and increased access to forest management opportunities. The First Nation expressed an interest in obtaining timber allocations for harvesting. A contract to develop a Native Background Information Report and Native Values mapping was completed by a member of the First Nation. A local forest company hired two skidders and crews from within the First Nation, as well as two members for tree trimming.

Nipigon District

Management units: Auden Forest, Lake Nipigon Forest, Nakina Forest, Longlac Forest, Geraldton Forest, Nakina North Forest, Ogoki Forest, Pic River Ojibway Forest, part of Black Sturgeon Forest

The 15 First Nations located in the Nipigon District are Aroland, Eabametoong, Ginoogaming, Kasabonika Lake, Lake Nipigon Ojibway, Landsdowne House, Long Lake #58, Marten Falls, Nibinamik, Ojibways of the Pic River, Pays Plat, Red Rock, Rocky Bay, Sand Point, and Webequie First Nations.

Aroland First Nation is discussing potential business, employment, planning, and licencing opportunities. The community had silvicultural contracts estimated at $121,000. It is estimated that 35 community members are employed in the forestry sector.

Eabametoong First Nation is discussing potential business, employment, planning and licensing opportunities. The community is pursuing overlapping agreements in two forest management units.

Ginoogaming First Nation has an estimated 60 members employed in the forest products mill in Longlac. The community received silvicultural contracts estimated at $116,000.

Lake Nipigon Ojibway First Nation is pursuing silvicultural opportunities. The community was under contract to complete tree planting and stocking assessments.

Marten Falls First Nation is discussing potential business, employment, planning and licensing opportunities. The community is pursuing overlapping agreements in two forest management units.

Ojibways of the Pic River First Nation, through an affiliate (Pic River Development Corporation), is at an advanced stage of negotiations for an overlapping FRL. The community developed and signed a business plan for participation in the SFL. The First Nation has a harvest allocation of 110,000 cubic metres of wood. There are an estimated 20 Aboriginal people employed in the forest sector.

Red Rock First Nation is harvesting under an overlapping FRL for 56,500 cubic metres of wood. It is estimated that 20 community members are employed in the forestry sector.

Rocky Bay First Nation has an overlapping FRL for 51,000 cubic metres of wood.

North Bay District

Management units: Temagami, Nipissing Forest

The three First Nation communities located within North Bay District are Dokis First Nation, Nipissing First Nation, and Temagami First Nation. North Bay District has also been working closely with a group of Aboriginal people associated with the Algonquins of Golden Lake First Nation, who identify themselves as the Mattawa/North Bay Algonquins community.

Discussions on forestry opportunities with Dokis, Nipissing, and the Mattawa/North Bay Algonquins are at an advanced stage. The value of contracts issued to Aboriginal communities in the district is estimated at $350,000 for pre-commercial thinning. The contract provided 2,302 person days of employment. The MNR provided partial funding ($30,000) for three liaison positions in aboriginal communities to pursue forest management opportunities and to participate in the forest management planning exercise. Three First Nation members attended tree marking training courses.

Dokis First Nation has an FRL licence with an allocation of 17,544 cubic metres of wood. Silvicultural contracts totaled $144,400. It is estimated that one First Nation member works in the forest sector.

A Nipissing First Nation member has an overlapping FRL licence under the SFL. A wood allocation of 14,938 cubic metres was available under the licence. Silvicultural contracts totaled $128,200. It is estimated that two First Nation members work in the forest sector.

Temagami had a 3,500 cubic metre wood allocation and silviculture contracts totaling $166,000. It is estimated that 11 community members work in the forest sector on a seasonal basis.

The Mattawa/North Bay Algonquin community, through an affiliated Aboriginal business (Madadjiwan Economic Development Corporation), has an FRL and a wood allocation of approximately 15,000 cubic metres. It is estimated that 35 Aboriginal people from the community work in the forest sector in the district. The First Nation received $118,000 in silvicultural contracts.

Parry Sound District

Management units: Bracebridge, Georgian Bay

The six First Nations located in the Parry Sound District are Henvey Inlet, Magnetawan, Moose Deer Point, Shawanaga, Wahta Mohawks, and

Wasauksing. As well, Dokis First Nation is active in forest management in the district.

Henvey Inlet First Nation is completing a Native Background Information Report and Native Values map.

Shawanaga First Nation is completing a Native Background Information Report and Native Values map and they have a member on the LCC.

Dokis First Nation had a $50,000 contract to complete silvicultural work. One First Nation member attended a tree-marking training course.

Pembroke District

Management units: Pembroke

Algonquins of Golden Lake First Nation has two participants that represent Aboriginal interests on the LCC. The Algonquins of Golden Lake First Nation, through an affiliated company (Makwa Community Development Corporation Inc.), are an overlapping licensee and associate partner on the SFL. As such, they have participated in the annual planning, silvicultural layout, and harvest operations. Randy Commanda Forestry Services, Reserve Forestry and Guiding, and Kakina Forestry Services are the primary Aboriginal businesses that are involved with the forestry operations on the SFL, and collectively they employed approximately seven Aboriginal people. Makwa Community Development Corporation administers timber allocations and the Corry Lake Tree Nursery, and employs five Aboriginal people on a permanent basis and provides several seasonal positions. Sustainable Forest License shareholding companies employ an estimated four members from the Algonquins of Golden Lake and 24 Aboriginal people from off-reserve. Twenty-four Aboriginal people attended forest management and related training sessions. Randy Commanda Forestry Services, Reserve Forestry and Guiding were under contract to harvest 10,000 cubic metres of wood.

Red Lake District

Management units: Trout Lake Forest, Red Lake Forest, Whiskey Jack Forest (Management for the Whiskey Jack Forest is administrated by Kenora District).

There are seven First Nations communities located within the Red Lake District including Deer Lake, Kee Way Win, MacDowell Lake, North Spirit Lake, Pikangikum, Poplar Hill, and Sandy Lake. Maamawai, a group of Aboriginal people living off-reserve in the community of Red

Lake, are involved in active discussions about economic development opportunities in the forest sector. All seven communities are remote, with winter access only, and are not located within designated district forest management units.

Maamawai met regularly with the MNR and the local forest companies to discuss employment opportunities in the forest sector.

A local forest company met with Cat Lake First Nation (located within Sioux Lookout District) to discuss long-term economic development opportunities.

Pikangikum First Nation is at an advanced stage in discussions on forest management opportunities.

An estimated 46 Aboriginal people work in saw mills and bush operations in the Red Lake District.

The MNR and a local forest company are co-sponsoring two Aboriginal students to attend Sault College's distance education Aboriginal Resource Technician program.

Sault Ste. Marie District

Management units: Algoma Forest, Mississagi

The five First Nations within the Sault Ste. Marie District are the Ojibways of Batchewana, Garden River, Thessalon, Mississauga, and Serpent River.

Mississauga First Nation had a manual-cleaning contract totaling $26,000.

The North Shore Tribal Council was in regular discussion with the MNR on forest management opportunities. Aboriginal participation in forest management planning and the preparation of a Native Background Information Report and collection of Native Values was discussed.

Other contracts issued to Aboriginal people totaled $23,000 for cone collection, regeneration assessment, and cruising. Wood allocations were issued to two Aboriginal forest companies on 1,819 hectares.

The MNR provided tree marker training assistance for six Aboriginal people. A local forest company provided training in regeneration assessment techniques and cruising.

Sioux Lookout District

Management units: Caribou Forest, Lac Seul Forest, Sioux Lookout (Abitibi), Sioux Lookout Crown Forest

There are 14 First Nations communities located in the Sioux Lookout District, of which only three (Lac Seul, New Slate Falls, and the Ojibway Nation of Saugeen) are located within the AOU of the Timber EA decision. Mishkeegogamang (Osnaburgh) and Cat Lake have some of their traditional lands located within these forest management units.

Lac Seul First Nation has 150,000 cubic metres of available wood supply that has not been pursued due to access concerns. It is estimated that 60 Aboriginal people are employed in a local sawmill, woodland operations, and ferry services.

Sudbury District

Management Units: Sudbury, Lower Spanish Forest, Spanish River

The ten First Nations within Sudbury District are McChigeeng (formerly West Bay), Sagamok Anishnawbek, Sheguiandah, Sheshegwaning, Ojibways of Sucker Creek, Wahnapitae Whitefish Lake, Wauwauskinga (formerly Whitefish River), Wikwemikong, and Zhiibaahaasing (formerly Cockburn Island).

Sagamok Anishinabek First Nation was allocated 6,400 cubic metres for harvesting. The SFL holder entered into a contract with the First Nation for tree-planting and pre-commercial thinning. The contracts provided an estimated twenty-four seasonal jobs for members in the community.

Whitefish Lake First Nation had a tree-planting contract estimated at $11,000 and a manual tending contract estimated at $19,000. A cone collection contract issued to the community was estimated at $8,600.

A conglomerate of ten First Nations were allocated 8,800 cubic metres of wood for harvesting.

Two private Aboriginal contracting companies had a tree-planting contract estimated at $77,000 and a manual-tending contract estimated at $11,000.

Eight individuals from local First Nations attended a tree-marking training course sponsored in part by the MNR. The SFL holder provided operational tree-marking training for one member from Henvey Inlet First Nation. Two forestry students, one from Dokis and a co-op student, were hired to work on the SFL during the summer.

Thunder Bay District

Management units: Dog River-Matawin Forest, Lakehead Forest, Spruce River Forest, Brightsand Forest, Black Sturgeon Forest, Armstrong Forest, Kiashke River

The four First Nations located within Thunder Bay District are Fort William, Gull Bay, Lac Des Mille Lacs, and White Sand. In addition, Thunder Bay District has been consulting with a number of Aboriginal communities and Metis organizations.

Lac Des Mille Lacs had an allocation to harvest 46,600 cubic metres of wood.

White Sand First Nation had an allocation to harvest 348,000 cubic metres of wood. The First Nation is a member of the forest management planning team for the Armstrong Forest. Regular community meetings were held as part of the native consultation process.

Timmins District

Management units: Romeo Malette Forest, Shiningtree, Timmins Forest, Timmins

Mattagami is the only First Nation in the district. Flying Post Reserve is also within the Timmins District boundary but all residents live off of the reserve, mainly in Nipigon. The district, in conjunction with Nipigon District, has attempted to establish contact with this First Nation. To date, there has been no response, but efforts will continue.

Mattagami First Nation is in discussion with the SFL holder on economic development opportunities on the Shiningtree Forest. Pre-commercial thinning contracts and other forest management opportunities were reviewed. The First Nation is an active member on the LCC, and on the Forest Management Planning Teams for the Shiningtree Forest and Romeo Malette Forest. The community had a contract to harvest 2,557 cubic metres of wood. Twelve community members received training and were certified as heavy equipment operators.

Matachewan First Nation (located in Kirkland Lake District) has an active member on the planning team for the Timmins Management Unit.

Wawa District

Management units: Big Pic Forest, Black River Forest, Magpie Forest, Nagagami Forest, Wawa Forest, White River Forest

The three First Nations located in the Wawa District are Hornepayne, Michipicoten and Pic Mobert. Discussions also take place with Pic River First Nation located adjacent to Wawa District but within the Big Pic Forest.

Hornepayne First Nation has an estimated 25 members employed in the forestry sector. The MNR contracted a community member to collect Native Values and background information for the Native Background Information Report and Native Values Map.

Michipicoten First Nation has a wood allocation of 1,000 cubic metres for harvesting. The First Nation purchased High Falls Lumber sawmill and secured a license to process 1,000 cubic metres of wood annually.

Pic Mobert First Nation has actively participated in forest management planning activities within the district. Pic Mobert First Nation negotiated a wood allocation of 4,666 cubic metres. The community was under contract with a forest company to plant 104,000 trees and to collect 54 hectolitres of tree cones.

Pic River First Nation had a wood allocation of 48,200 cubic metres for harvesting. The MNR contracted a community member to collect Native Values and background information for the Native Background Information Report and Native Values Map.

Chapter 10

Ongoing Developments and Future Directions

Ministry of Natural Resources keeps pace with the constantly expanding knowledge base for sustainable forest management through scientific research, technical development, and policy development programs. These programs span a wide range of subjects including: the development of better data and information sources; the creation and implementation of new policies, procedures, and guidelines for forest management planning; the development of new forest management methods, models, and tools; and, continuing long-term monitoring programs and scientific studies.

This chapter outlines the progress MNR has made, in cooperation with its partners, on specific scientific, technical, and policy development programs up to, and including, 1998/99.

New and Improved Data and Information Sources

Term and Condition #81 (T & C # 81) Provincial Wildlife Population Monitoring

Since 1990, MNR has worked in partnership with the federal government and non-government organizations to gain access to information and to expand the monitoring programs for a variety of wildlife species. Some of the program monitoring partners include the Long Point Bird Observatory, the Thunder Cape Bird Observatory, and the Canadian Wildlife Service. Species monitored include selected hawks and falcons, owls, songbirds, frogs, and small mammals.

Term and Condition #81 of the Timber Class EA was initiated in 1995 through partnerships with other monitoring groups. In 1996, MNR established the Wildlife Assessment Program, involving the staffing of three regional wildlife assessment units in North Bay, Timmins, and Thunder Bay. Staff in these units focus on the field monitoring of key wildlife species and on developing new wildlife monitoring methods.

During 1998/1999, the Wildlife Assessment Program continued its monitoring partnerships and proceeded with the development of an approach for monitoring wildlife representative of the Timber Class EA AOU. Partnerships with the Long Point and Thunder Cape Bird Observatories to collect long-term trends on migrant forest birds were continued. The partnership to monitor owls and red-shouldered hawks was also continued with the Long Point Bird Observatory. The Wildlife Assessment Program supported efforts by the University of Guelph to continue a small mammal monitoring study in Algonquin Park that began in the 1950s.

Development of the wildlife population monitoring program advanced through the publication of a list and rationale for wildlife species intended for long-term monitoring across the AOU. A sampling design and stratification approach was developed for the purpose of monitoring forest birds, small mammals and amphibians. Field sampling protocol development for these species continued through the initiation of pilot-level field studies. A partnership with the Canadian Wildlife Service continued to develop compatible methods of forest bird monitoring. Methods of monitoring furbearing species were also investigated by initiating trapper surveys.

Term and Condition #96 (T & C # 96) Silvicultural Effectiveness

Forest operation prescriptions are required for all forest operations on Crown forests in Ontario, to improve the reporting and tracking of silvicultural effectiveness. A prescription is a site-specific, integrated set of harvest, renewal, and maintenance activities that must be developed before any operations may begin on a particular site. The results from these prescriptions will be assessed and reported through the reporting requirements of the forest management planning process for Crown land in Ontario. Assessment protocols will be described in "Silvicultural Effectiveness Monitoring of Forest Management in Ontario".

In 1998/99, work on the development of the draft document was ongoing. Field assessment methods were developed and tested to determine the effectiveness of the clearcut, shelterwood, and selection silvicultural systems. The field methods tested included the use of modern information technology and resources to ensure efficient and effective data collection and analysis.

Term and Condition #97 (T & C # 97) Forest Ecosystem Classification Program

The provincial Ecological Land Classification (ELC) program has a mandate to establish a comprehensive and consistent province-wide framework for forest ecosystem description, inventory, and interpretation. The ELC is used in Ontario to address a full range of scales, from ecoregionalization to site/community level. The combination of a consistent ecological classification and comprehensive ecosystem-based inventory tools are pivotal to the achievement of MNR's objective of ecologically sustainable resource management. The ELC is designed to provide a common language and information framework for forest planning, management, and monitoring.

Traditional forest inventory in Ontario has included commercial tree species but has been missing an ecological context. Current work in the ELC is focused on providing a modern, comprehensive, ecologically-based inventory for Ontario, in which the traditional forest inventory information is embedded.

Current emphasis is being placed on the completion of core classification products, revising the provincial classification architecture, developing spatial technologies for ecosystem inventory at various scales, and on providing practical management applications of the ELC for management planning processes through the development of interpretive tools.

Program Status

The ELC program has completed forest ecosystem classifications for all areas in Ontario south of 51 degrees N latitude. In addition, wetland classification is complete for the northwest portion of the province. Early prototypes have been examined in central, northeastern, and southern parts of the province. Work has begun on non-forested and successional classifications to supplement the current systems. Work is just getting underway for the far northern part of the province.

Products have included a series of classification manuals; support manuals dealing with data standards, database structure, spatial studies, botanical references, and successional studies; and interpretive manuals. This work has also included the development of more generalized ELC-based Forest Unit classes to be used for aspects of forest planning and modeling.

Recent changes in legislation have encouraged a direct incorporation of the ELC into forest inventory and planning processes, silviculture guidelines, and a variety of environmental guidelines.

Provincial Database

At present, the provincial ELC database includes approximately 8,000 sample plots. Of these, almost 2,500 are third party data provided by other agencies. Currently the provincial database is undergoing restructuring and redesign to improve its efficiency and user access. A manual entitled "Ecological Data Collection Standards" has been prepared in draft form.

A variety of spatial data sets has been compiled to facilitate studies dealing with ecosystem inventory. Vegetation, soil, and topographic information has been collated for pilot mapping areas and for several extensive areas of the province.

Multi-scale Ecosystem Inventory and Spatial Capabilities

With the support of the MNR's geomatics and inventory groups, the ELC program has acquired full Geographic Information Systems (GIS) hardware and software capabilities. These facilities are being used for several mid- and fine-scale ecosystem mapping trials. Several studies are underway which are testing the feasibility of developing operational ecosystem inventory coverages for use in planning. A range of methods is being explored, including traditional air photo interpretation, ground surveys, and GIS-based Predictive Ecosystem Mapping approaches. Several publications dealing with the results from this work are anticipated.

Ecosystem Dynamics/Succession

The ELC program is designed to provide description and classification tools at a variety of scales. Work is ongoing to provide a better understanding of the changes of ecosystem classes over time. This knowledge will improve our ability to project forest landscape through time, and will provide approaches to 'animate' the currently static inventories. Earlier work dealing with ELC-based successional trends in northwestern Ontario is now being applied to succession related issues such as old growth conservation.

Education and Technology Transfer

In 1998-99, the Ecological Land Classification for Southern Ontario: First Approximation and Its Application, and the Ontario Plant List were completed and published. Work is underway to compile on-line photographic libraries in support of ELC products. A computer-based training package is under development to assist in teaching basic soils skills. ELC-based, photo-interpretive manuals for inventory are presently in draft form.

There continues to be a major emphasis on the training of MNR and partner staff in the use of the ELC. A number of workshops have also been held examining ELC approaches to inventory. During the year, a wide range of training sessions and workshops were provided for internal users, industry staff, municipalities, conservation organizations, and related agencies.

Work will continue to incorporate the ELC into major natural resource policy and planning tools such as the provincial silvicultural guides, the Old Growth Conservation Strategy, wildlife habitat guidelines, wood supply models, natural heritage conservation objectives, and related practices and guidelines.

Term and Condition #99 (T & C # 99) Areas of Natural and Scientific Interest (ANSIs)

Areas of Natural and Scientific Interest are areas of land and water containing natural landscapes or features that have been identified by MNR as needing protection for such values as natural heritage appreciation, scientific study, or education. These areas are classified as either Life Science, Earth Science, or combined. They are protected during forest management planning through the Area of Concern (AOC) process.

Life Science

Life science gap analysis efforts in 1998/99 were focused primarily on supporting the Lands for Life planning process. Gap analyses for all ecodistricts within the Lands for Life planning area were continued from the previous year, finalized, and provided to the Lands for Life Round Tables. Additional analyses were also conducted to search for alternative sites that could represent required ecosystems in many ecodistricts, and these analyses were also provided to the Round Tables for their deliberations on protected areas. In addition to ecodistrict representation work, park class target achievement was also assessed. Proposals for protected areas that would fill the relevant class targets (wilderness, natural environment, waterway classes) in each ecoregion or ecodistrict were also submitted to the Round Tables.

Discussions on various approaches to gap analysis were held with numerous internal and external clients and stakeholders. A review of the "floating reserves" concept was completed, and the role of AOCs in protecting biodiversity was discussed. A paper on the life science gap analysis methodology was presented at the annual meeting of the U.S. Gap Analysis Program.

Conservation land securements were made through partnerships with the Nature Conservancy of Canada, utilizing various mechanisms (purchases, donations, conservation easements). These securements were concentrated in the southern part of Ontario, mainly south of the AOU.

Earth Science

Earth science ANSI work in 1998/99 focused on identifying candidate sites for the Lands for Life Round Tables, and on refining boundaries and/or searching for alternate sites. Further field investigations of candidate earth science sites were also undertaken. New candidate sites identified through the ecological gap analysis process were investigated for potential overlapping earth science values. This involved extensive aerial reconnaissance and field investigations in Northwest Region, Northeast Region, and within the Great Lakes Heritage Coast area. In addition, selected candidate earth science and ecological sites in Southcentral Region were investigated for their geological values, and for the landform component of their landform-vegetation description taken from the gap analysis process.

An ongoing project continued to identify significant earth science features on Manitoulin Island in conjunction with the ecologists from the Ontario Parks Northeast Zone office.

Term and Condition #100 (T&C # 100) Growth and Yield Studies

The Forest Growth and Yield Program was established in 1991 to provide forest managers with better information on the growth and dynamics of Ontario's forests. Beginning in 1992, a province-wide network of permanent sample plots (PSPs) was established over a range of forest sites and management conditions. Data collected from these plots provides information to forest managers and researchers on site and soil conditions, vegetation composition, tree growth, regeneration and mortality, and wildlife habitat conditions in Ontario's forests. To date approximately 1,000 PSPs have been established.

In 1998/1999 the Growth and Yield Program focused primarily on the maintenance and remeasurement of the growth and yield permanent sample plot system. In addition, other historic and long-term permanent growth plot systems were relocated and reassessed for their incorporation into the developing provincial plot network.

In accordance with Ontario's Growth and Yield Masterplan, a review of the growth and yield sampling methodology was carried out in 1998/99, using a noted international sampling authority (Dr. Chip Scott, U.S. Forest Service). Through this review, some refinements to growth and yield data collection standards were made and incorporated into sampling protocols. No major deficiencies were noted in the sampling protocol, and changes were made largely to increase field sampling efficiency.

Efforts were also made during 1998/99 to produce informative summaries of historical growth and yield plot data to aid in forest resource management decision-making. As Ontario's new growth and yield plot network undergoes its first remeasurement cycle, this information will also be made available to Ontario's forest resource managers.

New Policies, Procedures and Guidelines

Term and Condition #27(c) (T & C #27(c)) Clearcut Restrictions

Ontario's Forest Management Planning Manual requires documentation for all planned clearcut areas by size class, and the rationale for any clearcut areas that exceed 260 hectares in size or that do not represent a range of sizes. These new reporting requirements began with the 1996/97 harvest year (but were reported in the following year in management unit annual reports). Provincial level reports are included for the first time with this 1998/99 annual report.

Term And Condition #52(e) (T & C #52(e)) Water Crossing Removal Criteria Development

A committee of technical experts from MNR, the Ontario Ministry of the Environment and Energy, and the forest industry developed a set of criteria to be used in decisions for the removal of water crossing structures on roads which are planned to be abandoned. This set of criteria, which addressed biological, engineering, water quality, and safety considerations, were outlined in a report published in October 1997, entitled "Criteria for the Removal of Water Crossings of Abandoned Roads".

Term and Condition #94(b) (T & C # 94(b)) Environmental Guidelines

MNR was required by the Timber Class EA to produce an implementation manual referred to as the Environmental Guideline for Timber Management Activities. This guideline was to provide direction in relation to timber harvest layout, configuration, and clearcut sizes, and to address the protection of the physical environment in the course of forest harvest, renewal, and maintenance.

The approach MNR took to meet this requirement was to initiate the development of two separate guidelines that address: 1) protection of the physical environment; and 2) timber harvest layout, configuration, and clearcut sizes.

In response to the first requirement, the "Forest Management Guidelines for the Protection of the Physical Environment" was published in January 1998.

In support of developing further direction regarding timber harvest layout and configuration, background research and analyses on historic fire patterns and on emulating natural disturbance patterns was continued in 1998/99. Work was also ongoing on analysis of fire disturbance sizes and frequency patterns at the site region level, with the involvement of the Provincial Forest Technical Committee.

Term & Condition #94(c) (T & C #94(c)) Guidelines for Pine Marten and Pileated Woodpecker Habitat

MNR was required by the Timber Class EA to develop two new guidelines: 1) Forest Management Guidelines for the Provision of Marten Habitat; and, 2) Forest Management Guidelines for the Provision of Pileated Woodpecker Habitat. As previously reported in the 1996/97 annual report, both guidelines were published in May 1996.

Term and Condition #98 (T & C # 98) Northern Ontario Wetlands Evaluation System

As previously reported in the 1995/96 annual report, the requirement to develop a Northern Ontario Wetlands Evaluation System has been delivered.

The evaluation system was designed to allow a relative ranking of the importance of wetlands based on numerical scores assigned to biological, physical, and social attributes. Wetlands that are highly ranked are considered to be of provincial significance and are protected by wetlands policy.

A system for evaluating wetlands in southern Ontario has been in place since 1984. This system was modified for use in northern Ontario. The Ontario Wetland Evaluation System Northern Manual was published in March 1993, with a revised manual released in May 1994.

Term and Condition #103(a) (T & C #103(a)) Old Growth Conservation Strategies

The goal of the Old Growth Conservation Strategy is to ensure that old growth forest ecosystems are maintained in the landscapes of Ontario now and into the future. This comprehensive strategy will be implemented through ecological land use and resource management planning processes.

In 1992, an Old Growth Forest Policy Advisory Committee was established. In May 1993, they released an interim report on conserving old growth red and white pine forests. In June 1994, MNR released A Conservation Strategy for Old Growth Red and White Pine Ecosystems for Ontario. Implementation of this strategy is under way through natural heritage conservation initiatives and through the forest management planning process. From 1995 to 1997, over 68,000 hectares of red and white pine old growth forest were protected as conservation reserves through regulations under the Public Lands Act.

The advisory committee released a final report in September 1994, containing recommendations for conservation of old growth forests of all species. In 1997, MNR drafted A Conservation Strategy for Old Growth Forest Ecosystems on Crown Lands in Ontario. A notice requesting public comment on this draft document was posted on the Environmental Bill of Rights registry. No comments were received. No additional work was done in 1998/99.

Term and Condition #106 (T & C #106) Roadless Wilderness Areas Policy

In May, 1997 the MNR released the first version of its roadless wilderness areas policy, entitled "Ontario's Approach to Wilderness: A Policy", as required by T & C #106. This policy states that wilderness values will be accounted for under the auspices of land-use planning and resource management planning, such as MNR's Lands for Life planning process, and under policy, legislation, and management programs developed in support of sustainable natural resource management in Ontario. "Ontario's Approach to Wilderness: A Policy" states that MNR will engage in three initiatives, and work is proceeding on these initiative as follows.

(a) To identify and establish outstanding wilderness parks and wilderness zones

As stated in Ontario's Living Legacy – Proposed Land Use Strategy, the MNR has concluded that the park class targets have been achieved to the extent possible within the planning area, given the nature of the values in specific areas, the extent of Crown land, and other values that need to be considered in land allocation decisions. Consideration will continue to be given to the park class targets in planning for the portions of site regions and districts that extend beyond the Land Use Strategy planning area (e.g., in Site Region 3S). Therefore, from the perspective of wilderness parks, it is unlikely that a wilderness park will be established in Site Region 5S. It is possible, however, that a wilderness park will be established in Site Region 3S under the auspices of future planning initiatives in the north. In addition, it is important to note that:

i. A planning and consultation process will be developed to consider future suggestions for areas that may provide improved representation of natural heritage features. Any potential protected areas will be subject to broad public consultation through a formal planning process.

ii. Wilderness zones will be identified through parks management planning.

(b) To continue to work with partners and clients in order to protect wilderness values in southern Ontario

Work is ongoing in southern Ontario Site Regions 6E and 7E, and will be completed as directed in the document Natures Best, Parks and Protected Areas: A Framework and Action Plan. For example, land securement under the Ontario Parks/Nature Conservancy of Canada Legacy 2000 Program, and the Natural Areas Protection Program contribute to the protection of significant natural heritage values. Private land stewardship initiatives such as the Conservation Land Tax Incentive Program also contribute to the protection of significant values.

(c) To identify and define the extent to which programs implemented on the intervening landscapes and waterscapes contribute to the maintenance and enhancement of wilderness characteristics, and to determine if there are any changes required to existing resource management and operational planning guidelines

An internal working group was formed by MNR to address the management of wilderness characteristics on the intervening landscapes, outside parks and other types of protected areas. The working group, comprised of MNR staff, is currently completing a report that will identify and define the extent to which programs implemented on the intervening landscapes and waterscapes contribute to the maintenance and enhancement of wilderness characteristics. The working group will also determine if there is a need to recommend any changes to existing resource management and operational planning guidelines.

Term and Condition #110 (T & C #110) District Land Use Guidelines

In February 1997, the Minister of Natural Resources announced Lands for Life, a comprehensive land-use planning process intended to integrate the protection and use of Ontario's natural resources. Three regional Round Tables, made up of citizens with a diverse range of interests, were established to provide advice to the Minister on land use in the AOU.

After carrying out extensive public consultation, recommendations were submitted by the Round Tables in July 1998. A consolidated version of the recommendations was released in October 1998, and over 14,000 public submissions were received. In March 1999, a Proposed Land Use Strategy was released for public comment and review.

New Forest Management Methods, Models and Tools

Term and Condition #80 (T & C #80) Long-Term Scientific Studies and Research

Tourism Effects Research

This study is designed to assess the effectiveness of the provincial Timber Management Guidelines for the Protection of Tourism Values, and to determine the effects of forest management on tourism values. Several initiatives contributed to the work on this study in 1998/99.

The development of a Northern Ontario Remote Tourism Decision Support System (NORT-DSS) and manual were completed. The NORT-DSS predicts how forest harvesting and a host of other setting and site characteristics will likely impact the destination choices of both experienced and non-experienced tourists for fly-in fishing to northern Ontario.

A resource-based tourism operator questionnaire was developed and sent out to the Northern Ontario Tourism Outfitter Association membership. The questionnaire asked operators for their evaluations of the forest management planning process, the issue resolution process, and the guidelines designed to protect tourism values. The questionnaire also provided opportunities for operators to suggest improvements.

As well, field crews continued the identification of sites for a shoreline aesthetics project. This collection of site information included an emphasis on inventorying sites with various forest harvesting disturbances.

Moose Guidelines Evaluation

This project is assessing the effectiveness of Ontario's Timber Management Guidelines for the Provision of Moose Habitat, and will determine the effects of current forest management practices on moose and other wildlife habitat. The following work was carried out in 1998/99:

- An agreement was made with Lotek Engineering Inc. to develop a remote "break-away" mechanism for use with downsized Global Positioning System (GPS) collars; field trials of prototypes were initiated in February, 1999.
- Collection and spatial analysis of location data for 60 moose on the first intensive study site continued; data recorded on GPS collars were downloaded in late-May/early-June and in mid-September, 1998, as well as at the time of recovery/refurbishment in February, 1999. Up to March 1999, more than 700,000 records have been downloaded from GPS collars.
- Evaluation and monitoring of moose aquatic feeding areas in the first Moose Guidelines Evaluation Project study area and at the Coldwater Lakes Experimental Study Site near Atikokan continued, following harvest activity that took place in the winter of 1995.

- Moose calving site studies were implemented in the first Moose Guidelines Evaluation Project study area.
- Testing of differential correction software from Lotek Engineering Inc. continued, as well as further development of home range analysis software.
- GPS collars deployed in February, 1998 were recovered, refurbished and redeployed by the recapture of 60 moose in February, 1999.
- Studies continued of moose condition associated with habitat use, in conjunction with capture/collaring operation. Blood, hair, and fecal samples were again collected at the time of capture; body measurements and condition scores were recorded for each animal, ultrasound measurements of back fat were made on each moose, and, complete profiles of blood samples taken will be carried out.
- A 50% aerial census of the moose population was carried out on an intensive study site in continuous clear-cut, dispersed block-cut, wildfire and old-growth Boreal Forest landscapes.

Landscape Analysis of Wildlife Habitat

This research program is examining the effects of the Timber Management Guidelines for the Provision of Moose Habitat, and other forestry practices, on wildlife habitat. The range of species studied includes edge-loving (e.g., moose) and edge-avoiding (e.g., marten) vertebrates. The focus of the research is on characterizing the effects of logging on habitat patch size and configuration, and on developing predictive models of how changes in landscape configuration influence the quality of wildlife habitat. An important component of the research is comparing landscape patterns created through logging with those created by natural disturbance processes.

The research also includes the development of spatial analysis tools to assist both researchers and field staff (including planning teams) who need to characterize changes in landscape patterns. Patch Analyst, Marten Analyst and Habitat Analyst are three GIS programs developed to assist in the analysis of landscape patterns, and to support landscape analysis in the forest management planning process.

The next stages of research in this area will be development of a new modeling tool to facilitate multiscale, hierarchical assessment and evaluation of landscape patterns. This tool will be essential in implementing new directions in both the Moose Habitat Guidelines and in the emulation of natural fire disturbance patterns. New research will also begin field testing models by observing breeding and resident bird population responses.

Aquatic Effects Research

These long-term scientific studies are designed to assess the effectiveness of the provincial Timber Management Guidelines for the Protection of Fish Habitat, with an emphasis on the numerical measurement and modeling of land-use effects on aquatic ecosystems in northern Ontario. To date, aquatic effects research has been addressed through two integrated projects, the Coldwater Lakes experimental watersheds and the Comparative Aquatic Effects Program.

The Coldwater Lakes study was initiated northwest of Atikokan in 1990, to evaluate the effects of logging on lake ecosystems, and to provide information about the effectiveness of shoreline reserves in preventing those effects. Five years of intensive pre-harvest monitoring (1991-1995) were to be followed by "worst case" experimental logging in 1996/97 (large cuts) and in 1998/99 (secondary cuts), and four years of post-harvest monitoring (1997-2000).

Minor to moderate aquatic impacts, similar to those caused by wildfire, have been observed in the three impacted lakes, primarily as temporary increases in nitrogen, potassium, and dissolved organic carbon in lake water, and an up to 25 percent decline in water clarity. Three to five years of further monitoring at reduced intensity are required to extract full benefit from this experiment. These, and other early results (many are now published in the scientific literature) suggest that the Timber Management Guidelines for the Protection of Fish Habitat and accompanying policy may be conservative in some respects, and that some shoreline forest reserves may be safely harvested and regenerated without harm to aquatic habitat or water quality. Adaptive management experiments to test the reliability of these results and their transferability to other areas of northern Ontario are now being planned.

The Comparative Aquatic Effects Program began in 1995 to measure the effects of timber management on aquatic ecosystems in Ontario's boreal forest and to test the effectiveness of current timber management guidelines in preventing or minimizing these effects. To date, the program has focused on measuring timber harvesting effects on coldwater streams.

Because coldwater stream habitat is tightly integrated with the surrounding landscape, it is expected to be sensitive to disturbances in the surrounding catchment. The program is investigating a number of areas, including the key aquatic habitat variables for monitoring the effects of timber harvest, the spatial scale of harvest impacts on aquatic ecosystems, the use of buffer strips to prevent sediment from moving overland and into waterways, and the effects of logging roads as barriers to fish migration.

Term and Condition #101 (T & C #101) Full-Tree Harvesting and Long-Term Site Productivity

This 20-year study was established in 1993 to provide a quantitative assessment of the effects of full-tree harvest and full-tree chipping on ecosystem processes and site productivity for a range of black spruce-dominated ecosites.

In 1998/99, the third growing season after experimental harvests were carried out, detailed field measurements and laboratory analyses were carried out on nine experimentally-treated sites. These data were collected to quantify early changes in soil nutrient pools; to provide an estimate of elemental nutrient leaching rates; to track logging slash decomposition rates; and, to measure early seedling growth rates.

Term and Condition #102 (T & C #102) Tending and Protection Improvement Programs

Ministry of Natural Resources has a number of ongoing projects related to pest management (insects and diseases) and vegetation management. Either on its own, or in partnership with other provinces and the private sector MNR has funded a number of research projects in these two areas.

Pest Management

The Canadian Forest Service (CFS) has been supported by MNR in the testing of neem, a botanical insecticide, for the control of insects affecting trees. This product is effective against insects, such as sawflies, which are not susceptible to the commonly used product Bacillus thuringiensis (B.t.). In particular, MNR has supported studies looking at the aquatic impacts of neem, as well as the development of methodologies for its aerial application. The work is being done in partnership with the CFS, the County of Simcoe, and the provinces of New Brunswick and Newfoundland.

Other projects related to the pest management aspect of T & C #102 include:

- Support of a CFS study into the impacts, ecology, and control methods for pine false webworm (in partnership with Department of National Defense and the County of Simcoe).
- Testing of the Advanced Integrated Multidimensional Modeling Software 2 (AIMMS 2) guidance system, which uses weather parameters from the forest canopy to adjust the location of aerial spray lines so as to minimize off-target drift and optimize the even deposit of the spray over the target stand (in partnership with the province of New Brunswick and Forest Protection Limited).
- Testing of new B.t. products for controlling spruce budworm (in partnership with the CFS, and with funding from pesticide manufacturers).
- Trials are on-going to refine the pheromone for jack pine budworm for use as a detection method and possible control measure (in cooperation with Simon Fraser University).
- Support to the CFS in an on-going research project to develop early intervention strategies to reduce, or slow, the build up of spruce budworm populations.
- Support to the University of Toronto to examine the role of natural enemies in the population dynamics of the European pine shoot beetle, a recently introduced insect.
- Funding to the University of Toronto to publish the proceedings of the 1998 Pine Shoot Beetle Workshop.
- Support to the CFS for research towards developing a hazard rating system for pine shoot beetle.
- Support to a University of Toronto study into the impacts of site preparation methods on the biodiversity of insect fauna (in collaboration with E.B. Eddy Forest Products, now Domtar Inc.).
- A study conducted by MNR into the impacts of pine false webworm on native pines.
- Funding of a graduate student with the University of Toronto to assess bark beetle responses to the 1998 ice storm.
- Funding to the CFS to develop a field guide to the insects of Ontario conifers.

Vegetation Management Alternatives

Since 1991, the focus of the Vegetation Management Alternatives Program (VMAP) has been to reduce dependence on herbicides in Ontario's forests by developing effective, safe, economically viable alternatives, along with a better understanding of forest ecosystems. This has been accomplished through basic and applied research, education, and field delivery.

Fundamental research is ongoing to advance the underlying science that supports vegetation management practices, with an emphasis on ecosystems dynamics, biological control, and social interfaces. Numerous articles, reports, and journal papers in this area have been published.

One of the goals of VMAP is to ensure that the alternatives being developed are environmentally sound. To this end, a major study called the Fallingsnow Ecosystem Project, was established in 1993 to evaluate the effects of five alternative conifer-release treatments on the environment in a young spruce plantation located near Thunder Bay, Ontario. Researchers are comparing the effects of cutting with brushsaws, cutting with a mechanical cleaning machine, and applying herbicides by helicopter, with what happens in untreated control plots and in the adjacent unharvested forest. Data collection and analysis from the Fallingsnow Ecosystem Project will continue until 2002, when tenth-year post-treatment results will be reported.

A second environmental impact study was established near Parry Sound in central Ontario in 90- to 100-year-old white pine. The objective of this study is to examine the effects of the shelterwood system regeneration cut and four site preparation techniques on the components of white pine ecosystems, including: the overstory (health, seed production); white pine regeneration (establishment, ecophysiology, response to competition); and, ecosystem components (plant diversity and succession, carabid beetle and salamander populations, downed woody debris, nutrients).

Partnerships with Natural Resources Canada, Lakehead University, and the forest industry (Abitibi-Consolidated Inc., Bowater Inc., Domtar Inc., Grant Forest Products Inc., Tembec Inc., and Westwind Forest Stewardship Inc.) are being developed to ensure the continuation of this work, including the re-measurement of established trials and the initiation of new trials.

Term and Condition #104 (T & C #104) Socio-Economic Analysis

As identified in the 1995/96 annual report, a Socio-Economic Impact Model (SEIM) has been developed by MNR to help in the determination of economic and social impacts of non-timber values and alternative forest management scenarios in forest management planning. Training on the model is ongoing with forest management planning teams, and the model is updated as required.

Term and Condition #107 (T & C #107) Biodiversity Assessment, Landscape Management, and Wildlife Habitat Supply Modeling

Landscape Ecology

The provincial Forest Landscape Ecology Program (FLEP) is assessing the effects of natural change and human activity on biodiversity and forest sustainability at the landscape level.

The FLEP accomplished the following in 1998/1999.

- Improvement of the ON-FIRE model

  The ON-FIRE model has been re-coded to work on a Windows NT platform. Considerable improvements have also been made to its graphical user interface. These modifications enhance the user-friendliness of the model and acceptability to the user community in MNR. In addition, an expert-opinion-based vegetation transition matrix has been added to the fire model. Several technology transfer workshops were also held for regional- and district-level users within MNR.

- Improvement of the LEAP II Decision Support System

  Changes and improvements were made to the Landscape Ecological Analysis Package Version 2.0 (LEAP II). The major improvements include re-coding for the Windows NT platform, enabling direct output to MNR's standardized data formats, and a graphical user interface. The user manual for the new version was also published, and several workshops were held to train both users and trainers.

- Deriving an Eco-regional framework for Ontario

  A Hierarchical Eco-regional Framework (HEF) was completed based on net primary productivity, to the ecodistrict level. This prototype study demonstrates the value and the need for hypothesis-based construction of ELC systems. The methodology and the results were published in peer-reviewed media. Several technology transfer workshops were held for policy developers and regional planners.

- Quantifying Ontario's Ecological Classification Systems

  Existing ELC systems were quantified and compared using multivariate techniques. This study demonstrates the need to develop and use ELCs based on land-use objectives. The results of this study were published in peer-reviewed media, and presented at several seminars.

- Evaluating Methods of Predicting Species Richness

  The study of methods of predicting species richness was concluded. This study demonstrated the importance of spatial scale and null models in predicting species richness using species-area curves. The results were published in peer-reviewed media.

- Developed an Interactive Digital Atlas of Fire History of Ontario

  A CD-ROM-based GIS atlas of fire history of Ontario was completed, with an accompanying user manual. This atlas summarizes and presents the fire history in Ontario in an interactive and a user-friendly manner.

- Published a Book on the Landscape Ecology of Ontario's Managed Forest

  The manuscript of this book, containing 16 different chapters on the ecology of managed forest landscapes of Ontario, was submitted to the University of British Columbia Press.

- Landscape Analyses for Judicial Review

  Regional and sub-regional analyses of landscape patterns, net primary productivity, and bounds of natural variation of landscape indices were conducted in support of the Judicial Review of Forest Management Plans.

Wildlife Habitat Supply Analysis

Wildlife habitat supply modeling investigation and development work is ongoing. A spatial habitat supply model, the Ontario Wildlife Habitat Assessment Model (OWHAM), has been developed for the Southcentral Region for moose, marten, pileated woodpeckers, and red shouldered hawks. This model is currently being modified for use in northeast Ontario. A combined habitat and population model for marten has been acquired and is being tested in support of the eventual evaluation and revision of the marten habitat guidelines. A spatial allocation model (STANLEY), for use with the Strategic Forest Management Model (SFMM), is under development and evaluation. Two new models have undergone initial development in 1998/99: Marten Analyst, to be used in the application of the marten habitat guidelines and Cut Patch Analyst, to be used to assess natural disturbance patterns so that landscape patterns created by forest harvesting better match those of natural disturbance patterns.

Term and Condition #108 (T & C #108) Geographic Information Systems

Geographic Information Systems are designed to aid in the storage, organization, analysis, and presentation of complex geographic data using computer systems. They are essential for the full development of modern resource management methods, models, and tools.

In 1994, MNR selected a GIS software standard. This GIS standard has been installed in all MNR district and area offices. As well, systems were installed in regional offices, science units, research units, and systems development units. Systems, software and technical training have been provided.

MNR has proceeded to build applications using GIS, and has implemented those systems in appropriate offices. This includes MNR's corporate data repository, the Natural Resources and Values Information System. As well, GIS has been used extensively to support forest management planning, as well as in support of corporate initiatives such as the Lands for Life land use planning initiative, and the analysis required as a result of the Judicial Review of Forest Management Plans.

Strategic Forest Management Model

The SFMM is used in Ontario to explore forest management strategies and options, and to evaluate potential resource benefits, including available supplies of wood products, areas of potential wildlife habitat, and measures of forest diversity. This model is used by MNR to help model and project the development of Ontario's forests through time, in light of natural forest dynamics and the effects of human intervention. SFMM can be used to project the future forest condition, forest dynamics, available wood supply, potential wildlife habitat, and forest diversity, through time horizons of 150 to 200 years.

SFMM is used widely by MNR and other forest resource organizations, including consultants and forest products companies. SFMM is the core tool used by Forest Management Planning teams to develop "management alternatives, including the Available Harvest Area". These models are also used to support other business areas such as land use planning regional wood supply strategies.

In 1998/99, MNR continued its ongoing development and transfer of SFMM, including: a completely rewritten user guide; the training of forest management planning teams; and, the development of related data management applications to help evaluate wood supply impacts of Lands for Life planning decisions. Work on the model was also initiated in 1998/99 to provide significantly better representation of forests managed through the shelterwood and selection silvicultural systems, and to improve the reporting of forest dynamics and the links with spatial harvest scheduling models and forest management plan table production tools.

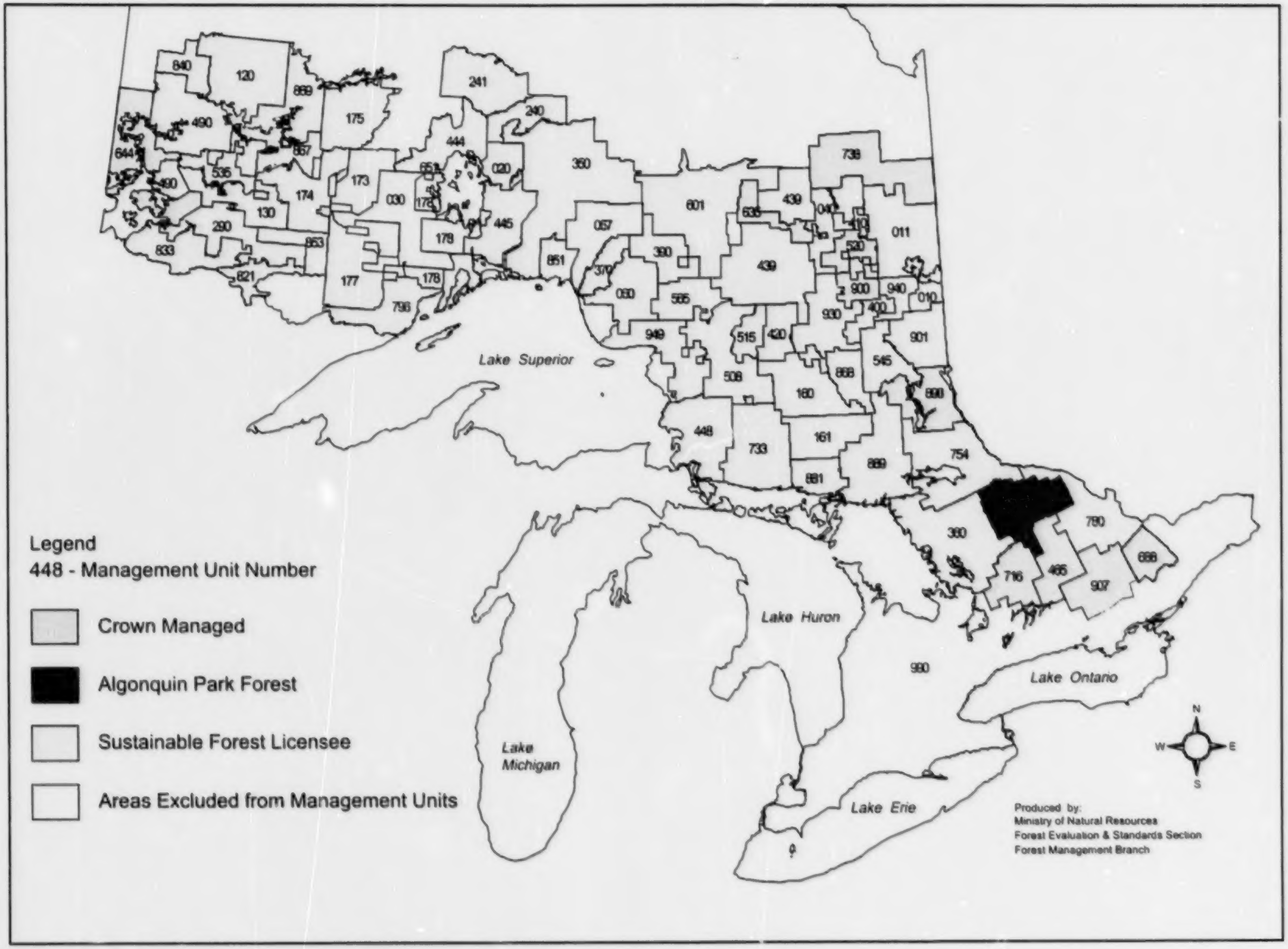
Appen[redacted]

Appendix 1
All Land Classifications within Inventoried Area 1996

Total Areas by Land Class (hectares)			By Ownership and Type					By Forest Region		ALL
	Crown Lands					Non-Crown Lands		All Ownerships		
Land Classifications	Regular Crown Forest	Parks and Rec. Reserve & Protection	Outside AOU* Northern Units	Outside AOU* Southern Units	Total	Private Forest	Federal Forest	Boreal Forest	Great Lakes St. Lawrence & Deciduous	Grand Total
Forested Land										
Productive Forest	26,004,850.6	3,584,157.5	4,456,454.7	94,060.0	34,139,522.8	5,764,085.3	398,927.4	29,672,153.3	10,630,382.3	40,302,535.6
Non-Productive Forested Land										
Open Muskeg	691,952.7	83,922.6	96,239.8	11,012.0	883,127.1	189,870.9	17,405.1	676,016.3	414,386.8	1,090,403.1
Treed Muskeg	1,232,211.3	108,981.0	1,035,347.9	656.0	2,377,196.1	136,681.7	11,824.0	2,226,403.2	299,298.7	2,525,701.8
Brush & Alder	846,499.8	46,905.5	172,524.1	5,074.0	1,071,003.4	235,002.5	11,058.1	960,521.5	356,542.4	1,317,063.9
Rock	388,042.1	33,171.9	36,785.1	3,371.0	461,370.1	88,350.1	10,384.0	254,926.8	305,177.4	560,104.2
Sub-total:	3,158,705.8	272,981.0	1,340,896.9	20,113.0	4,792,696.8	649,905.1	50,671.2	4,117,867.8	1,375,405.2	5,493,273.1
Non-Forested Land										
Developed Agricultural Land	4,520.4	889.0	0.0	13,666.0	19,075.4	4,602,433.1	12,545.0	102,125.0	4,531,928.5	4,634,053.5
Grass & Meadow	8,089.2		0.0	7,983.0	16,072.2	966,581.5	5,223.0	34,478.5	954,393.1	987,876.6
Unclassified Land	241,087.9	9,019.9	3,045.0	3,599.0	256,751.8	809,533.8	64,917.0	236,353.7	894,849.0	1,131,202.6
Unsurveyed Land	2,767.0	3,106.0	0.0	0.0	5,873.0	27,719.0	192,624.0	6,386.0	219,830.0	226,216.0
Sub-total:	256,464.4	13,014.9	3,045.0	25,248.0	297,772.3	6,406,267.4	275,309.0	379,343.1	6,601,000.6	6,979,348.7
Water	5,627,304.7	259,103.5	1,138,110.0	1,640,433.0	8,664,951.2	2,110.0	9,129.0	4,946,471.7	3,729,718.5	8,676,190.2
Grand Total:	35,047,325.6	4,129,256.9	6,938,506.6	1,779,854.0	47,894,943.1	12,822,367.9	734,036.6	39,115,835.9	22,336,506.7	61,451,347.6
Relative Percentages										
Forested Land	42.3 %	5.8 %	7.3 %	0.2 %	55.6 %	9.4 %	0.6 %	48.3 %	17.3 %	65.6 %
Non-Productive Forested Land	5.1 %	0.4 %	2.2 %	0.0 %	7.8 %	1.1 %	0.0 %	6.7 %	2.2 %	8.9 %
Non-Forested Land	0.4 %	0.0 %	0.0 %	0.0 %	0.5 %	10.4 %	0.4 %	0.6 %	10.7 %	11.4 %
All Land Classifications	47.9 %	6.3 %	9.4 %	0.2 %	63.8 %	20.9 %	1.2 %	55.6 %	30.3 %	85.9 %
Water	9.2 %	0.4 %	1.9 %	2.7 %	14.1 %	0.0 %	0.0 %	8.0 %	6.1 %	14.1 %
Total:	57.0 %	6.7 %	11.3 %	2.9 %	77.9 %	20.9 %	1.2 %	63.7 %	36.3 %	100.0 %

*AOU – Area of Undertaking

Appendix 2
Management Units in the Area of the Undertaking and Forest Management Planning Responsibilities (Crown Lands) April 1, 1999


840
120
869
241
240
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420
901
Lake Superior
545
508
866
890
180
448
733
161
754
889
881
780
380
686
716
465
907
Lake Huron
990
Lake Ontario
Lake Michigan
Lake Erie
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Legend
448 - Management Unit Number
Crown Managed
Algonquin Park Forest
Sustainable Forest Licensee
Areas Excluded from Management Units
Produced by:
Ministry of Natural Resources
Forest Evaluation & Standards Section
Forest Management Branch

Key to the Management Units (April 1, 1999)
(designated under the Crown Forest Sustainability Act, Section 7)

MU #	MU Name	Status	Region	MU #	MU Name	Status	Region
448	Algoma Forest	SFL	NE	907	Mazinaw	CR	SC
451	Algonquin Park Forest	AFA	SC	716	Minden	CR	SC
444	Armstrong Forest	SFL	NW	733	Mississagi	SFL	NE
020	Auden Forest	SFL	NW	738	Moose River	CR	NE
465	Bancroft	CR	SC	390	Nagagami Forest	SFL	NE
067	Big Pic Forest	SFL	NE	240	Nakina North Forest	SFL	NW
370	Black River Forest	SFL	NE	754	Nipissing Forest	SFL	NE
178	Black Sturgeon Forest	SFL	NW	241	Ogoki Forest	SFL	NW
173	Brightsand Forest	SFL	NW	780	Ottawa Valley Forest	SFL	SC
175	Caribou Forest	SFL	NW	851	Pic River Ojibway Forest	SFL	NW
520	Cochrane	CR	NE	420	Pineland Forest	SFL	NE
177	Dog River-Matawin Forest	SFL	NW	840	Red Lake Forest	SFL	NW
410	Driftwood Forest	SFL	NE	930	Romeo Malette Forest	SFL	NE
535	Dryden Forest	SFL	NW	853	Sapawe Forest	SFL	NW
545	Elk Lake	SFL	NE	868	Shiningtree Forest	SFL	NE
174	English River Forest	SFL	NW	867	Sioux Lookout Forest	SFL	NW
821	Flanders Forest	SFL	NW	040	Smooth Rock Falls Forest	SFL	NE
833	Fort Frances Forest	SFL	NW	990	Southern Ontario	CR	SC
360	French-Severn Forest	SFL	SC	881	Spanish River	SFL	NE
439	Gordon Cosens Forest	SFL	NE	030	Spruce River Forest	SFL	NW
601	Hearst Forest	SFL	NE	889	Sudbury Forest	SFL	NE
290	Highrock Forest	SFL	NW	508	Superior Forest	SFL	NE
011	Iroquois Falls Forest	SFL	NE	898	Temagami	CR	NE
010	Iroquois Falls South	SFL	NE	901	Timiskaming	SFL	NE
515	J.E. Martel Forest	SFL	NE	900	Timmins	CR	NE
635	Kapuskasing	CR	NE	400	Timmins Forest	SFL	NE
350	Kenogami Forest	SFL	NW	120	Trout Lake Forest	SFL	NW
644	Kenora	CR	NW	160	Upper Spanish Forest	SFL	NE
651	Kiashke River	CR	NW	130	Wabigoon Forest	SFL	NW
869	Lac Seul Forest	SFL	NW	940	Watabeag	SFL	NE
445	Lake Nipigon Forest	SFL	NW	949	Wawa Forest	SFL	NE
796	Lakehead Forest	SFL	NW	490	Whiskey Jack Forest	SFL	NW
688	Lanark	CR	SC	060	White River Forest	SFL	NE
161	Lower Spanish Forest	SFL	NE				
565	Magpie Forest	SFL	NE				

Status	Forest Management Planning Responsibility
SFL	Sustainable Forest Licence
CR	Crown
AFA	Algonquin Forest Authority

Appendix 3
Forest Management Plans Approved for Implementation in 1998 and 1999, Plans Scheduled for Approval and Implementation in 2000, 2001 and 2002

Plans Approved for Implementation in 1998

Management Unit Name	MU#	District	Remarks
Cochrane	520	Cochrane	
Driftwood Forest	410	Cochrane	
Lanark	688	Kemptville	One year contingency plan
Moose River	738	Cochrane	
Red Lake	840	Red Lake	Renamed Red Lake Forest – April 1999
Timmins Forest	400	Timmins	
Wabigoon Forest	130	Dryden	
White River Forest	060	Wawa	

Plans Approved for Implementation in 1999

Management Unit Name	MU#	District	Remarks
Brightsand Forest	173	Thunder Bay	
Elk Lake	545	Kirkland Lake	Two year Contingency Plan
French-Severn Forest	360	Parry Sound	Formerly Bracebridge and Parry Sound
Kapuskasing	635	Hearst	
Lanark	688	Kemptville	Two year Contingency Plan
Magpie Forest	565	Wawa	
Nipissing Forest	754	North Bay	Formerly North Bay
Temagami	898	North Bay	
Trout Lake Forest	120	Red Lake	
Upper Spanish Forest	160	Chapleau	One year Contingency Plan
Watabeag	940	Kirkland Lake	
Whiskey Jack Forest	490	Kenora	Formerly Patricia Forest and Pakwash Forest

Plans Scheduled for Approval and Implementation in 2000

Management Unit Name (current or proposed)	MU#	District	Remarks
Algoma Forest	448	Sault Ste. Marie	
Algonquin Park Forest	451	Algonquin Park	

continued next page

Armstrong Forest	444	Thunder Bay	
Dog River-Matawin Forest	177	Thunder Bay	
English River Forest	174	Dryden	
Fort Frances-Flanders Forest	833/821	Fort Frances	Fort Frances Forest and Flanders Forest to be amalgamated, new MU# is 827
Gordon Cosens Forest	439/635	Hearst	Gordon Cosens Forest and Kapuskasing to be amalgamated, new MU# is 438
Iroquois Falls Forest	011/010	Cochrane	Iroquois Falls Forest and Iroquois Falls South to be amalgamated, new MU# is 012
Kenogami Forest	350	Nipigon	Formerly Longlac Forest, Nakina Forest and Geraldton
Northshore Forest	733/881	Sault Ste. Marie	Mississagi and Spanish River to be amalgamated, new MU# is 680
Sapawe Forest	853	Fort Frances	
Smooth Rock Falls Forest	040	Cochrane	
Spanish Forest	160/161	Sudbury	Upper Spanish Forest and Lower Spanish Forest to be amalgamated, new MU# is 210
Sudbury Forest	889	Sudbury	
Wawa Forest	949	Wawa	

Plans Scheduled for Approval and Implementation in 2001

Management Unit Name (current or proposed)	MU#	District	Remarks
Bancroft-Minden Forest	465/716	Bancroft	Bancroft and Minden to be amalgamated
Black River Forest	370	Wawa	
Black Sturgeon Forest	178	Nipigon	Scheduled for early approval
Dryden Forest	535	Dryden	Early renewal by one year
Hearst Forest	601	Hearst	Scheduled for early approval
Pineland-Martel Forest	515/420	Chapleau	Early renewal by one year, J. E. Martel Forest and Pineland Forest to be amalgamated

continued next page

Kenora	644	Kenora	
Lac Seul Forest	869/867	Sioux Lookout	Lac Seul Forest and Sioux Lookout Forest to be amalgamated
Lake Nipigon Forest	445/020	Nipigon	Lake Nipigon Forest and Auden Forest to be amalgamated
Mazinaw-Lanark Forest	907/688	Bancroft	Mazinaw and Lanark to be amalgamated
Nagagami Forest	390	Wawa	Early renewal by one year
Ottawa Valley Forest	780	Pembroke	Formerly Pembroke
Pic River Ojibway Forest	851	Nipigon	Formerly Steel River, scheduled for early approval
Romeo Malette Forest	930	Timmins	Early renewal by one year
Shiningtree Forest	868	Timmins	
Spruce River Forest	030	Thunder Bay	Scheduled for early approval
Superior Forest	508	Chapleau	Early renewal by one year
Timiskaming Forest	545/901/940	Kirkland Lake	Elk Lake, Timiskaming, and Watabeag to be amalgamated
Timmins	900	Timmins	

Plans Commencing Preparation in 2000, for Approval and Implementation in 2002

Management Unit Name (current or proposed)	MU#	District	Invitation to Participate - Tentative Date and Remarks
Big Pic Forest	067	Wawa	March 2000
Caribou Forest	175	Sioux Lookout	February 2000
Crossroute Forest	290/833/821	Fort Frances	March 8, 1999 (planning process initiated early) Highrock Forest and Fort Frances-Flanders Forest to be amalgamated
Lakehead Forest	796	Thunder Bay	February 2000

Appendix 4
Forest-dependent Communities (ranked by percentage of forestry workers)

Census subdivision	Type	1996 Population	Labour Force	Forestry Workers	% Forestry
Dubreuilville	Township	990	555	360	64.9%
White River	Township	1,025	555	300	54.1%
Terrace Bay	Township	2,325	1,275	605	47.5%
Carlow	Township	430	140	65	46.4%
Longlac	Town	2,075	1,235	570	46.2%
James	Township	485	235	105	44.7%
Ginoogaming First Nation 77	Reserve	220	55	20	36.4%
Dack	Township	480	200	70	35.0%
Iroquois Falls	Town	5,685	2,575	900	35.0%
Red Rock	Township	1,255	675	230	34.1%
Smooth Rock Falls	Town	1,985	975	330	33.8%
Dorion	Township	470	245	80	32.7%
Mattice-Val Cote	Township	935	370	120	32.4%
Val Rita-Harty	Township	1,115	495	150	30.3%
Brudenell and Lyndoch	Township	795	350	105	30.0%
Nipigon	Township	2,205	1,090	325	29.8%
Opasatika	Township	350	155	45	29.0%
Chapleau	Township	2,935	1,415	410	29.0%
Rainy Lake 18C	Reserve	65	35	10	28.6%
Espanola	Town	5,450	2,470	695	28.1%
Head, Clara and Maria	Township	295	125	35	28.0%
Baldwin	Township	695	330	90	27.3%
Constance Lake 92	Reserve	600	185	50	27.0%
Fauquier-Strickland	Township	690	260	70	26.9%
Kapuskasing	Town	10,030	4,655	1,200	25.8%
Sherwood, Jones and Burns	Township	2,140	860	220	25.6%
Ignace	Township	1,785	965	245	25.4%
Atikokan	Township	4,040	1,995	505	25.3%
Duck Lake 76B	Reserve	100	40	10	25.0%
Moonbeam	Township	1,330	605	150	24.8%
Mattawa	Town	2,280	870	215	24.7%
Nakina	Township	570	265	65	24.5%
Dryden	Town	6,685	3,475	840	24.2%
Barclay	Township	1,585	870	210	24.1%
Airy	Township	775	380	90	23.7%

Census subdivision	Type	1996 Population	Labour Force	Forestry Workers	% Forestry
Thessalon Township	Township	765	380	90	23.7%
Thessalon	Town	1,480	510	120	23.5%
Massey	Town	1,170	440	100	22.7%
Wunnumin 1	Reserve	455	155	35	22.6%
Raglan	Township	825	400	90	22.5%
Hearst	Town	6,015	2,995	660	22.0%
Wollaston	Township	720	300	65	21.7%
Iron Bridge	Village	780	330	70	21.2%
Nipissing, Unorganized, South Part	Unorganized	605	265	55	20.8%
Schreiber	Township	1,795	920	190	20.7%
Glackmeyer	Township	1,095	535	110	20.6%
Hagarty and Richards	Township	1,675	755	155	20.5%
Rainy River, Unorganized	Unorganized	1,525	890	180	20.2%
Hornepayne	Township	1,455	795	160	20.1%
Long Lake 58	Reserve	345	50	10	20.0%

Source: Statistics Canada 1996 Census

Appendix 5
Forest Renewal Charges ($ per cubic metre) for 1998/99

Region	Management Unit Name	White and Red Pine	Conifer	Poplar and White Birch	Hardwood Grade 1	Hardwood Grade 2
		Rates Charged by Tree Species or Groups of Species				
Northwest	ARMSTRONG FOREST	11	4	0.5	8	1.5
	AUDEN FOREST	11	4.5	0.5	8	1.5
	BLACK STURGEON FOREST	11	6	0.5	8	1.5
	BRIGHTSAND FOREST	11	6	0.5	8	1.5
	CARIBOU FOREST	11	6	0.5	8	1.5
	DOG RIVER - MATAWIN FOREST	11	6	0.5	8	1.5
	DRYDEN	11	4.9	0.75	8	1.5
	ENGLISH RIVER FOREST	11	6	0.5	8	1.5
	FLANDERS FOREST	11	5.5	0.5	8	1.5
	FORT FRANCES FOREST	11	5.5	0.5	8	1.5
	HIGHROCK FOREST	11	5.5	0.5	8	1.5
	KENOGAMI FOREST	11	4.9	0.5	8	1.5
	KENORA	11	6	0.5	8	1.5
	KIASHKE	11	6	0.5	8	1.5
	LAC SEUL FOREST	11	3.5	0.5	8	1.5
	LAKE NIPIGON FOREST	11	4	0.5	8	1.5
	LAKEHEAD FOREST	11	6	0.5	8	1.5
	NAKINA NORTH FOREST	11	6	0.5	8	1.5
	OGOKI FOREST	11	6	0.5	8	1.5
	RED LAKE	11	5.5	0.5	8	1.5
	SAPAWE	11	6	0.5	8	1.5
	SIOUX LOOKOUT FOREST	11	6	0.5	8	1.5
	SPRUCE RIVER FOREST	11	5.5	0.5	8	1.5
	STEEL RIVER	11	4.5	0.5	8	1.5
	TROUT LAKE FOREST	11	6	0.5	8	1.5
	WABIGOON FOREST	11	6	0.5	8	1.5
	WHISKEY JACK FOREST	11	6	0.5	8	1.5
Northeast	ALGOMA FOREST	11	6	0.5	8	1.5
	BIG PIC FOREST	11	5	0.5	8	1.5
	BLACK RIVER FOREST	11	6	0.5	8	1.5
	COCHRANE	11	7.5	0.5	8	1.5
	DRIFTWOOD FOREST	11	4.2	0.75	8	1.5
	ELK LAKE	11	4	0.33	8	1.5

		Rates Charged by Tree Species or Groups of Species				
Region	Management Unit Name	White and Red Pine	Conifer	Poplar and White Birch	Hardwood Grade 1	Hardwood Grade 2
	GORDON COSENS FOREST	11	0	0	8	1.5
	HEARST FOREST	11	4.25	0.4	8	1.5
	IROQUOIS FALLS FOREST	11	5.5	0.5	8	1.5
	IROQUOIS FALLS SOUTH	11	5.5	0.5	8	1.5
	J. E. MARTEL FOREST	11	2.8	0.5	8	1.5
	KAPUSKASING	11	6	0.5	8	1.5
	LOWER SPANISH FOREST	11	6	0.5	8	1.5
	MAGPIE FOREST	11	5.75	0.5	8	1.5
	MISSISSAGI	11	6	0.5	8	1.5
	MOOSE RIVER	11	3	0.5	8	1.5
	NAGAGAMI FOREST	11	5.48	0.75	8	1.5
	NIPISSING FOREST	11	6	0.5	8	1.5
	NORTH BAY	11	6	0.5	8	1.5
	PINELAND FOREST	11	6	0.5	8	1.5
	ROMEO MALETTE FOREST	11	0	0	8	1.5
	SHININGTREE	9.17	5	0.42	6.67	1.25
	SMOOTH ROCK FALLS	11	0.5	0.5	8	1.5
	SPANISH RIVER	11	6	0.5	8	1.5
	SUDBURY	11	6	0.5	8	1.5
	SUPERIOR FOREST	11	3	0.5	8	1.5
	TEMAGAMI	11	6	0.5	8	1.5
	TIMISKAMING	11	4	0.33	8	1.5
	TIMMINS	11	7.2	0.6	8	1.5
	TIMMINS FOREST	11	3.54	0.75	8	1.5
	UPPER SPANISH FOREST	11	6	0.5	8	1.5
	WATABEAG	11	4	0.33	8	1.5
	WAWA FOREST	11	6	0.5	8	1.5
	WHITE RIVER FOREST	11	4	0.5	8	1.5
Southcentral	ALGONQUIN PARK FOREST	6.5	1.5	0.5	8	1.5
	BANCROFT	11	6	0.5	8	1.5
	BRACEBRIDGE	11	6	0.5	8	1.5
	GEORGIAN BAY	11	6	0.5	8	1.5
	LANARK	12	6	1.5	9	1.5
	MAZINAW	12	6	1.5	9	1.5
	MINDEN	12.5	6	0.5	8	1.5
	PEMBROKE	11	6	0.5	8	1.5
	SOUTHERN ONTARIO	11	6	0.5	8	1.5